The Chemical Age

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Contents

	PAGE
EDITORIAL NOTES: Mr. Morton's Address; A New Bill for Chemists; Gas Cylinder Research; U.S. Potash Prices	223
The Structure of the More Common Fats	225
The Four Component System: Dr. Freeth's Inaugural Lecture	226
Chemical Notes from Westminster	230
From Week to Week	231
References to Current Literature	232
Patent Literature	233
Weekly Chemical Prices and Market Reports	236
Company News	240
Commercial Intelligence, New Companies Registered; Chemical Trade Inquiries; Tariff Changes	242

DYESTUFFS MONTHLY SUPPLEMENT: The Development of Fast Dyeing and Dyes: Conclusion of Mr. Morton's Address 17–24

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders, and Postal Orders should be made payable to Benn Brothers, Ltd.*

Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, *have for some years past adopted the five-day week, and the editorial and general offices (Bouverie House, 154, Fleet Street, London, E.C.4) are closed on Saturdays.*

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Mr. Morton's Address

IN commenting a fortnight ago on Mr. James Morton's paper on the development of fast dyeing and dyes, before the Royal Society of Arts, we confessed a "feeling that so remarkable a contribution ought to have taken some official form, such as the Messel Lecture," meaning, of course, some form that would have expressed a recognition by the whole science of chemistry of so important a series of achievements. This comment has brought us from Professor Henry E. Armstrong, who presided over the lecture, an interesting note which we are glad to publish.

"Whilst I fully appreciate," Professor Armstrong writes, "the implication of the closing sentence of your leader (February 23) on Mr. Morton's account of his Hunting of the Vat Dye Snark, given at the Royal Society of Arts on February 20, I am thoroughly of opinion, from long observation, that no better platform than that which the Society now affords is to be found; the *Journal* goes everywhere, into all circles, and is very widely consulted. The Society is not the self-righteous body that so many specialist societies are, and it publishes without fuss or favour. It deserves support, if only on account of the simplicity and honesty of its methods. Mr. Morton has honoured himself in thus broadcasting his message.

"Had the address been delivered before any special body, it would not have made so wide and general an appeal; nor would it have been so valuable an object-lesson for business men. The importance of Mr. Morton's historical sketch of his achievement—an importance of which I feel sure he is in no way conscious—lies in the proof it affords that success is to be gained by understanding your business and believing in it, to the extent of throwing art, heart and head into its management: in being scientific at all stages—working with reasoned knowledge, not empirically. Whoever uses Sundour fabrics, having read the account, will be able in future to look upon them with an understanding and appreciation which will make them objects of special interest—even to realise how much romance lies hidden within their folds."

A New Bill for Chemists

CONSIDERABLE interest was taken a little over two years ago in an Act incorporating a body known as the Quebec Association of Professional Chemists, with certain powers for establishing standards for professional chemists. This did not constitute chemistry a "close" profession, but it did attempt a definition of chemistry in the following words: "The practice of professional chemistry means the practice for hire, gain, or hope of reward of any branch of chemistry, including organic, inorganic, metallurgical, biochemical, and analytical chemistry." A revised bill is now before the Quebec Legislature, which abandons the attempt to define chemistry, but which aims at restricting the exclusive use of the term "professional chemist" to members of one organisation, the Quebec Association.

If the Bill is passed, therefore, only members of the Association will be able to designate themselves "professional chemists"; there would, however, be nothing, apparently, to prevent others from undertaking chemical work, or, so far as one can see, from adopting any chemical designation that does not clash with "professional chemist." It is a fine point whether, for example, the latter term would exclude such terms as "works chemist," "technical chemist," "agricultural chemist," and so on. The one sure point is that only members of the Association can call themselves "professional chemists." The Bill for securing this privilege does not, we understand, conflict in any way with the legal rights of other bodies similarly incorporated, such as the Professional Engineers and Pharmacists. Even among chemists, in the province covered by the Bill, there appears to be considerable division of opinion on the measure, which raises questions of principle and of organisation of great interest to the profession everywhere.

Gas Cylinder Research

THE Gas Cylinders Research Committee of the Department of Scientific and Industrial Research, originally appointed in 1918, published its first report ("Cylinders for Use in Commerce for the Transport of 'Permanent' Gases") in 1921, and its second ("Periodical Heat Treatment") in 1926. The third and fourth reports, dealing respectively with alloy steel light cylinders and cylinders for liquefiable gases, have just been issued; while a further publication "Summary of Recommendations on Ordinary Commercial Cylinders for the Permanent Gases" (reprinted with revisions from the first report), is now in the press. The Committee completed its work with the issue of the fourth report, and it has now been dissolved.

With regard to alloy steel light cylinders, the subject has been considered from the standpoint of the reduction of weight for cylinders used for medical, aeronautical and mine-rescue work. Only for use in special cases where extreme lightness is highly important the Committee recommends the use of relatively thin cylinders of nickel-chromium-molybdenum steel fulfilling certain specifications. In the fourth report, dealing with cylinders for liquefiable gases, the Committee deal with such matters as filling ratios, the dimensions and material of cylinders, and their manufacture and testing. A prefatory note by Mr. H. T. Tizard, secretary to the Department of Scientific and Industrial Research, indicates that two questions had been raised by various interests, as deserving of the issue of recommendations, *e.g.*, the acceptance by one firm of the test marks of another, and the private ownership of gas cylinders. It has, however, been decided that these issues, of great importance from the point of view of safety of the trade in compressed gases, fall outside the range of scientific inquiry, and they are therefore to be considered by the Home Office.

U.S.A. Potash Prices

FROM the rather confused accounts that have reached this country, it appears that the United States Federal authorities have taken certain steps in limitation of the powers of the German and Alsatian potash interests as exporters of potash to the United States. Under a decree of the Federal Court these interests are now restrained from combining to violate the Anti-Trust Laws, from controlling retail prices, and from making unfair discriminations between purchasers. The proceedings arose out of charges made in Congress that the European potash exporters were proposing to combine to increase the cost of potash to the American consumer, and that this would constitute a "foreign monopoly." The decree appears to represent a settlement by agreement.

Books Received

FUEL RESEARCH TECHNICAL PAPER No. 21. THE ASSAY OF COAL FOR CARBONISATION PURPOSES. Department of Scientific and Industrial Research. London: H.M. Stationery Office. Pp. 34. 1s.

EVAPORATING, CONDENSING AND COOLING APPARATUS. By E. Hausbrand. Revised and enlarged by Basil Heastie. London: Ernest Benn, Ltd. Pp. 468. 25s.

DIE UNTERSUCHUNG UND BEGUTACHTUNG VON DUNGEMITTELN, FUTTERMITTELN, SAATWAREN UND BODENPROBEN. By Dr. Paul Krische. Berlin: Paul Parey. Pp. 386. Rm. 24.

The Calendar

Mch.		
11	Institute of Metals (Scottish Section): "The Anodic Treatment of Aluminium for Corrosion." M. Parkin. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
11	Ceramic Society: "Factory Floors." F. Heron Rogers. 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent.
12	Institution of Petroleum Technologists. 5.30 p.m.	John Street, Adelphi, London.
13	Society of Chemical Industry (Glasgow Section): "Bi-centenary Address on Joseph Black." John A. Cranston.	Glasgow.
13	Institute of Metals (Swansea Section): "Corrosion, with Special Reference to Non-Ferrous Alloys." A. G. Ramsay. 7 p.m.	Thomas' Café, High Street, Swansea.
13	Institute of Fuel: "The Industrial Use of Gas." F. W. Goodenough.	London.
14	Institute of Metals: Conversazione and Exhibition. 8 p.m.	Science Museum, Exhibition Road, London.
14	West Cumberland Society of Chemists and Engineers: "The Preparation of Coal for Sale." Dr. Briggs. 7 p.m.	Workington.
14	Society of Chemical Industry (Birmingham Section): Annual Meeting. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.
14	Optical Society: Annual General Meeting. 7.30 p.m.	Imperial College, South Kensington, London.
14	Oil and Colour Chemists' Association: "The Drying of Vegetable Oils." R. S. Morrell. "A Study of Whiting and Linseed Oil." R. G. Browning. 7.30 p.m.	30, Russell Square, London.
15	Oil and Colour Chemists' Association: Annual Dinner.	Connaught Rooms, London.
15	Society of Chemical Industry, Institure of Chemistry, and Newcastle Chemical Industry Club. Joint Dinner. 7.15 p.m.	Tilley's Restaurant, Blackett Street, Newcastle.
15	Society of Chemical Industry (Liverpool Section): Annual Meeting. "Boiler Feed Water." L. O. Newton. 6 p.m.	University, Liverpool.
15	Society of Dyers and Colourists (Scottish Section): "The Necessity and Application of Fast Colours on Textile Fibres." Frank Asquith.	
15	Royal Institution: "The Distribution of the Chemical Elements." N. M. Goldschmidt. 9 p.m.	21, Albemarle Street, London.
18	Society of Dyers and Colourists (Huddersfield Section): "The Practical Routine of Piece Dyeing." H. Wilkinson.	Huddersfield.
19	Institute of Chemistry (Bristol Section): Annual Business Meeting. 7.30 p.m.	University, Bristol.
19	Institute of Chemistry and Society of Chemical Industry (Edinburgh Sections): "Heat Transmission." J. Arthur Reavell. 8 p.m.	36, York Place, Edinburgh.
19	Hull Chemical and Engineering Society: "Naturally Occurring Catalyst Poisons in Oils." T. Andrews. 7.45 p.m.	Grey Street, Park Street, Hull.
19	Institute of Metals (N.E. Coast Section): Annual General Meeting and Exhibition of Metallurgical Preparations and Products. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
19	Institution of Petroleum Technologists. Annual Meeting. 8.30 p.m.	John Stræt, Adelphi, London.
19	Institute of Metals (Birmingham Section): "Aluminium." Dr. N. F. Budgen. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.
20	Society of Glass Technology. 2.30 p.m.	Leeds.
20	Institution of Chemical Engineers: Seventh Annual Corporate Meeting and Annual Dinner.	London.

The Structure of the More Common Fats

Professor Hilditch Describes Recent Advances in Our Knowledge

A MEETING of the Manchester Section of the Society of Chemical Industry was held on Friday, March 1, Mr. L. Guy Radcliffe presiding, when a paper entitled "Recent Advances in our Knowledge of the Structure of the more Common Fats" was read by Professor T. P. Hilditch, Campbell Brown Professor of Industrial Chemistry in the University of Liverpool.

Professor Hilditch said that it had long been a somewhat curious feature of the industries which utilised natural fats that, while the processes employed had been in many cases in the forefront of technological and engineering achievement, and while an elaborate analytical technique had been built up for the purpose of rapid technical control, there had been a great lack of precise information concerning the fundamental structure of the compounds present.

Two Classes of Industries

Obviously the industries interested in fats could be divided into two classes, namely, those (such as soap and candle manufacturers), who were concerned with the utilisation of the fatty acids as liberated from the fats, and those (manufacturers of edible fats, paints and varnishes, linoleum, etc.) who employed the fats in the form of glycerides without splitting them into the component acids.

The first class had relied mainly for many years past upon what might be termed average characteristics, such as the saponification value, the iodine value and the "titer" or setting point of the fatty acid mixture. It was evident that any values of this kind might in specific cases be the same for mixtures of fatty acids of quite different chemical composition. It was in this connection that there had frequently been elaborated in the course of the past 15 or 20 years the need of more detailed information which permitted a near estimate of the ultimate chemical composition of the mixed fatty acids from a fat to be obtained. The methods referred to were based on a preliminary separation of the fatty acids into two or more groups by means of the differing solubility of their lead salts in alcohol or ether; the methyl or ethyl esters of the separated groups could then be fractionally distilled under quantitative conditions, and from the ester fractions ultimately obtained it was possible to deduce the quantitative composition of the mixture. Alternatively the more unsaturated groups of acids might be converted into bromo-addition products, which, after partial resolution by crystallisation, were analysed with respect to equivalent weight and bromine content, a procedure which appeared to be preferred by some workers.

It might, therefore, be said that there was at the present time no reason why the user of natural fatty acids should not be in possession of practically complete knowledge of the constituents present, and, as a matter of fact, the usual range of variation in the composition of the mixed fatty acids of the more common industrial fats was available in the literature in the form of communications by a number of workers during the past five or six years.

Constitution

It was equally desirable, however, that industries which employed natural fats as such should have at their disposal a similarly complete knowledge of their constitution, and this depended, not only on the kinds and proportions of the different fatty acids present, but also to a marked degree on the manner in which the fatty acids were distributed among the glycerol residues. Definite information upon this last point was only recently beginning to come to hand, for the difficulties hinted at in the separation of closely allied fatty acids paled into insignificance compared with those attending any separation of the corresponding glycerides which might be formed by the union of a mixture of several of these acids with the trihydric alcohol glycerol. Even with only three fatty acids (e.g., palmitic, stearic and oleic) the number of theoretical possibilities was somewhat alarming, and although all the possibilities were possibly not utilised in nature in most cases, there was a good deal of evidence that many fats, both animal and vegetable, were very complex.

Many attempts had been made during the past 30 years to resolve different natural fats into their component glycerides by fractional crystallisation, but with little or no success. Bömer, who was unable to obtain any trilaurin from coconut or palm kernel fats, had lately shown that the crystallisation process indicated the presence of much trilaurin in a laurel fat and of trimyristin in nutmeg fat, but in both these latter cases the mixed fatty acids present were exceptional in that they were made up of a large proportion of either lauric or myristic acid accompanied only by oleic acid, and this in comparatively small amounts. Hence, in these cases there was bound to be trilaurin or trimyristin present.

Japanese Workers

The qualitative work mentioned had been developed mainly by the school of Japanese chemists, who had taken a prominent place for some time past in research in fats, and also by some of the German chemists. The method used, which had so far been chiefly applied to drying oils, was an extension of the old fractional crystallisation process, but the oils were first brominated and the mixture of bromine-addition products so produced was subjected to fractional crystallisation.

The glycerides of linseed oil were stated by Suzuki and Yokoyama to include dilinoleo-linolenin, two varieties of linoleo-dilinolenins, and oleo-dilinolein, while Eibner had isolated the bromo-derivatives of two linoleo-dilinolenins and of oleo-dilinolenin. Similarly, in soya bean oil, Suzuki and Yokoyama reported the presence of oleo-dilinolein, linoleo-dilinolenin and dilinoleo-linolenin, while Hashi had in addition found evidence of oleo-dilinolenin, oleo-linoleo-linolenin and dipalmitolein.

Suzuki and Masuda had, again, isolated a large number of mixed unsaturated glycerides by bromination of cod liver oil and whale oil.

The alternative method of attack which was being developed was most suited to fats which contained considerable proportions of both saturated and unsaturated fatty acids in combination, namely, a class which included nearly all the edible fats and many of those used in soap-making. The procedure consisted in oxidising the neutral fat in acetone solution with anhydrous permanganate, when it had been found possible to oxidise the unsaturated components disruptively and completely. Thus, an original mixture of fully saturated and mixed saturated-unsaturated glycerides became a corresponding mixture respectively of neutral and acidic compounds, and it only remained to separate the acidic from the neutral material and determine the composition of the mixed acids in each part in order to obtain an insight into the structure of the original fat. While the oxidation itself was comparatively straightforward, the quantitative separation of the acidic and neutral glycerides was a matter of some difficulty.

In conclusion, Professor Hilditch stated that recent work had not indicated how natural fats might be imitated by synthetic procedure in the factory.

The Honours List

THE NEW YEAR HONOURS LIST, which was delayed for seven weeks owing to the illness of the King, includes the following names:—

A BARONY, Sir Jesse Boot, for services in the promotion of education. He was formerly chairman and managing director of Boot's Pure Drug Co., Ltd., of which his son is now chairman. He presented to the University of Nottingham the new buildings and their site opened by the King last July, and gave £50,000 to endow a chair of chemistry in the University.

KNIGHTHOODS: Lieut.-Colonel K. P. Vaughan-Morgan, M.P., director and vice-chairman of the Morgan Crucible Co., Ltd.; Councillor W. Cundiff, ex-Lord Mayor of Manchester.

G.B.E.: Sir W. S. McCormick, F.R.S., chairman of the Advisory Council of the Department of Scientific and Industrial Research.

C.B.E.: Mr. J. J. Burton, chairman of the Advisory Committee on the Metalliferous Mining and Quarrying Industry; Major J. A. Sadd, superintendent of the Defensive Munitions Department, Porton.

The Four Component System

Lecture by Dr. F. A. Freeth

DR. F. A. FREETH, F.R.S., of Imperial Chemical Industries, Ltd., Honorary Lecturer in the Theory and Practice of Heterogeneous Equilibria at University College, London, gave his inaugural address at the College on Friday, March 1, on Component System in Peace and War."

In the course of his lecture, Dr. Freeth pointed out that since the theories of heterogeneous equilibria dealt with the inter-relationships of solids, liquids and gases, the subject was automatically of intense interest to all chemical manufacturers. The particular type of four component system with which the lecturer dealt was what was known as the reciprocal salt pair. One of the latest and best known examples of this was the conversion saltpetre process, whereby potassium chloride and sodium nitrate were converted into potassium nitrate and sodium chloride. The lecturer developed the subject along the lines of Meyerhoffer, one of the pioneers of the subject.

Method of Representation

The method of representation, however, used to explain the original arguments was of the most modern and simple type, namely, that developed by Professor Janecke, of the Technical High School, Hanover. This method of representation takes the form of a cube, the base of which represents all the possible mixtures of the salts, whilst water is plotted vertically. It was shown that considering the base of such a cube only, that is to say the relative proportions of the salts, such base could be considered as being divided into four areas, each of which represented saturation with respect to one of the four salts under consideration.

It was shown that if by any means a solution could be obtained within an area representing saturation with respect to a particular salt, then generally speaking it would be possible to obtain that salt in a pure condition. The famous reciprocal salt pairs of commerce were then considered, particular attention being paid to the ammonia-soda process, which was developed in this country by the late Dr. Ludwig Mond, F.R.S., the father of Lord Melchett, chairman of Imperial Chemical Industries.

Several other well-known working processes were also discussed, notably that of the caustification of sodium carbonate by lime, giving caustic soda. It was pointed out that all the above old commercial processes had been developed empirically, and it would be generally found that current practice corresponded very closely with the optimum conditions predicted by a stringent theoretical treatment.

The Great War

Reactions of this character had played a very important part in the great war. Fixed nitrogen was essential for modern explosives, both propellants and the high explosives used for bursting charges in shells. Until the last war, the main source of fixed nitrogen had been Chili sodium nitrate, which on treatment with sulphuric acid yielded nitric acid, which could be used for the production of high explosives such as trinitrotoluene and propellants such as cordite, and could by neutralisation with ammonia be made to yield ammonium nitrate. It was manifestly impossible for the Germans to hope to maintain open the long sea route to Chili. They, therefore, as a part of their preparations for war, developed the Haber and the Ostwald processes. The Haber process makes ammonia, using as raw materials coke, air and water. The Ostwald process, by burning ammonia with a limited quantity of oxygen, converts it into nitric acid. After these processes were once developed on a sufficiently large scale Germany was independent of any outside supplies of fixed nitrogen.

The above two processes, however, more especially the Haber process, required very considerable advances in technique. On the outbreak of war it soon became manifest that immense supplies of fixed nitrogen would be required by this country. The general staffs, both those of our enemies and our own, completely under-estimated the high explosive requirements of modern warfare. Even assuming that the productive capacity of this country, making nitric acid on the old lines, would have been sufficient, there was a shortage of toluene for the necessary quantity of T.N.T. had that explosive been exclusively used. It was speedily discovered that T.N.T. could be diluted with no less than four times its weight of ammonium nitrate without impairing the high explosive properties of the mixture. The supply of ammonium nitrate, therefore, became of vital importance. Lord Moulton, the director of Explosive Supply, was faced with a dilemma. Was he to attempt to erect Haber and Ostwald plants of the necessary size, or should he attempt to make ammonium nitrate by double decomposition, using Chili nitrate as his source of fixed nitrogen? He decided on the latter course, for the very good reason that he considered the enormous calls on technical men of every kind rendered it almost out of the question for it to be possible at that time to develop what was in this country an entirely novel process.

Double Decomposition Processes

The double decomposition processes which were used in the war were three, and nearly all of them had been considered as technically impossible after practical trial. These processes were: (1) The ammonia-soda reaction on sodium nitrate, giving ammonium nitrate and sodium bicarbonate; (2) Conversion of the waste calcium chloride of the ordinary ammonia-soda process into calcium nitrate by double decomposition with sodium nitrate, and the subsequent decomposition of the calcium nitrate with ammonium carbonate yielding ammonium nitrate and calcium carbonate; and (3) Double decomposition of sulphate of ammonia and sodium nitrate giving ammonium nitrate and sodium sulphate. This latter process after initial failure subsequently became successful.

The lecturer pointed out the reasons for the initial failure and for the final success. This process was worked on a very large scale in Great Britain, and upon a still larger scale in the United States. All the above processes were developed both theoretically and practically in the research laboratories of Brunner, Mond and Co., of which the lecturer was the head.

Theoretical Basis of the Work

Finally tribute was paid to the extraordinary help which those engaged in developing this process had received from the theoretical work of the Dutch school, notably Professor Schreinemakers in Leyden. The germ of all the theories involved went back to a most distinguished American mathematical philosopher, Willard Gibbs.

The lecturer urged that the above processes, which in their time had played a singularly important part in the national crisis, formed a concrete reason and example for detached theoretical study of industrial problems, and bore out the contention of Leonardo da Vinci that science must be the captain and practice the soldiers.

Parent Coal Carbonisation Trust

THE subscription list was opened on Tuesday for 1,200,000 8 per cent. cumulative participating preference shares of 10s., and 1,200,000 deferred ordinary shares of 1s. in the Parent Coal Carbonisation Trust, Ltd. Lord Askwith is chairman of the Trust, which is acquiring for this country the rights in connection with the Aicher process of low-temperature carbonisation of coal, evolved by Mr. Alfred Aicher (chief engineer to the Trust) during the war as a result of expenditure by the German Government, who utilised metallurgical plants in that country for the urgent production of oil from coal. Among the many plants engaged was the well-known Thyssen works at Mulheim in the Ruhr, and Dr. Rosen, formerly director-general of Thyssens, who has become a director of the new company, has given an exhaustive statement, an extract from which appeared in the prospectus, of the results obtained from their five units of 120 tons each daily capacity. The rotary ovens to be erected are stated to be simple in construction, cheap and safe in working. The process is a true low-temperature carbonisation, viz., the by-products recovered are gas, oils, and domestic fuels, with a very small proportion of tar products.

The process, while suitable for other types of coal, is especially applicable to cannel coal. Agreements have been entered into with the Pentrich Colliery Co. and the Franco-British Oil Trust for the erection of installations, and the first units of the plants are expected to be in operation in August next. The installations will be erected on a profit-sharing basis. The trust proposes to erect its own first installation to treat cannel coal on a site adjacent to Campbelltown Colliery. This installation will ultimately be of 1,000 tons daily capacity.

Gas Cylinder Research

Recommendations of the Committee

THE Gas Cylinders Research Committee of the Department of Scientific and Industrial Research has just published its third and fourth reports. The third deals with alloy steel light cylinders (pp. 74, 12s. 6d.), and the fourth with cylinders for liquefiable gases (pp. 151, 4s.), both being issued through H.M. Stationery Office.

With regard to light cylinders, reduction in weight is of importance for cylinders used for medical, aeronautical, and mine rescue work. Duralumin cylinders were investigated, but for various reasons this line of investigation was dropped. Attention was concentrated on alloy steel light cylinders, and the committee decided to recommend for use cylinders of nickel-chromium-molybdenum steel. The report states that where it is important to have very light small cylinders, it is recommended that nickel-chromium-molybdenum steel cylinders be used for the storage and transport of " permanent " gases, subject to various conditions.

The chemical composition of the steel used should be as follows (per cent.): nickel 2·5, chromium 0·6, molybdenum 0·6, manganese 0·6, carbon 0·3, silicon 0·15, sulphur 0·04 maximum, phosphorus 0·03 maximum, the balance being iron. Other conditions laid down deal with tests with which the material and finished cylinders should conform, design and capacity, design of neck, working pressure, working stress, wall thickness, heat-treatment, cleaning, periodical examination, fittings, marking, painting, and packing for transit purposes.

Liquefiable Gases

The fourth report mentioned above deals with cylinders for the conveyance of the liquefiable gases, that is, those gases which have relatively high critical temperatures, and which are generally reduced to the liquid condition by the pressures used in charging them into the cylinders. For the purposes of the report, the Committee investigated the following gases:—Sulphur dioxide, ammonia, chlorine, methyl chloride, ethyl chloride, hydrocyanic acid, phosgene, carbon dioxide, nitrous oxide, and ethylene.

The recommendations for ordinary commercial cylinders for the storage and transport of liquefiable gases indicate that material of construction should be carbon steel having the following approximate composition:—Carbon 0·20–0·25 per cent., sulphur not to exceed 0·045 per cent., phosphorus not to exceed 0·045 per cent., manganese 0·45 to 0·75 per cent., silicon not to exceed 0·2 per cent., the balance being iron. No alloy steel should be used for this purpose.

Further recommendations lay down general conditions for the supply of the steel; the manufacture of the cylinders; *wall-thickness; necking operation; weight; heat-treatment;* protection of valves; testing of completed cylinders; filling and working pressure, etc. Special recommendations are made as regards individual gases and particular groups of gases.

Completion of Committee's Work

A prefatory note to the fourth report, written by Mr. H. T. Tizard, states that: " The present report completes the work for which the Gas Cylinders Research Committee was appointed. Earlier reports dealt with (*a*) ordinary commercial cylinders for the permanent gases; (*b*) the periodical heat-treatment of carbon steel cylinders; and (*c*) alloy steel light cylinders for special purposes.

" In the course of the Committee's deliberations the desirability of issuing recommendations on the following questions was raised:—Whether the acceptance by one firm of the test marks of another should be permitted; and whether private ownership of gas cylinders should be permitted. Both these questions clearly raise issues of importance from the point of view of safety of the trade in compressed gases, but equally clearly the problems involved cannot be solved by scientific investigations, but require exhaustive consideration from many other aspects. For this reason, since the Committee was appointed as a technical body primarily to determine the technical conditions which should be observed in the manufacture, testing and charging of cylinders for the conveyance of compressed gases, it was not considered proper for the Committee to attempt to pronounce on questions falling completely outside the range of scientific enquiry.

" These, and other matters of a similar nature affecting the regulation of the industry in the interests of the public, will be considered by the Home Office.

" On the completion of the work dealt with in this report, the Gas Cylinders Committee was dissolved. A sub-committee appointed to consider and report upon the storage and transport of chlorine and other gases otherwise than in solid-drawn cylinders will remain in being as a special committee of the Department, and will present a separate report."

Magadi Soda Developments

The Prince of Wales's Visit

IN the I.C.I. *Magazine* for March it is stated, in connection with the Prince of Wales's rush home from Eastern Africa, that the Magadi Soda Co., through its port works at Mombasa, was privileged to render some assistance. " On November 30 the news was received that the cruiser H.M.S. *Enterprise*, southward bound, would make Mombasa the next day and must fuel with all possible speed. Our port manager was able to allow the cruiser to come alongside our pier and draw fuel oil from our installation while at the same time oil was pumped into her from barges drawn up on the opposite side of the vessel. Early on the morning of the 1st, she steamed into harbour, looking beautiful in the early morning sun, while a tense excitement seemed to fill the air. At 6.30 a.m. she was ' warped ' alongside and the connection with the feed pipe made in a matter of minutes. A station ashore was established in close proximity to the telephone and in charge of a very efficient yeoman of signals who was kept busy with a stream of messages to and from his ship. By 1.30 p.m. the fuelling was complete, and the *Enterprise* steamed gracefully out into the stream to continue her voyage to Dar-es-Salaam, where the Prince awaited her.

" Little more than a fortnight previously the Prince of Wales had honoured our Rest House at Kajiado with a visit. His Royal Highness arrived at sundown and was met by our general manager, Mr. Gill, who afterwards introduced him to the matron and other employees of the company who were staying at the Rest House. The Prince appeared to be quite familiar with our East African ways, for he joined the guests in residence with their ' Sundowners ' and seemed quite content to play ' Peep Bo ' with the children and listen to the strains of ' Ol' Man River ' from the gramophone. The Prince terminated his visit with a hearty handshake all round.

" We congratulate Mr. Gill, our general manager, and Mr. Bracegirdle, jun., on being the first to travel through to Nairobi by motor car. The journey was accomplished in four hours on December 20, 1928, along our new road. This 84-mile road to the capital will be much appreciated by the residents at Lake Magadi, for instead of the usual two days' travelling by train we shall be able to motor there and back in a day."

British Association Arrangements

THE Council of the British Association will nominate Dr. F. O. Bower, F.R.S., lately Regius Professor of Botany in the University of Glasgow, as president of the Association for the year 1930, when the meeting will be held in Bristol. The Association has received from the Court of Common Council (the Corporation of the City of London) the expression of a hope that London will be selected as the place of meeting in the centenary year, 1931, and offering entertainment to the Association in that event. This invitation has been accepted, and the centenary meeting will therefore be the first ever held in London.

Appointments Vacant

ASSISTANT for work in connection with research on Water Pollution.—The Secretary, Department of Scientific and Industrial Research, 16, Old Queen Street, Westminster, London, S.W.1. March 20.

CHEMIST in the Main Drainage Department, Public Works Ministry, Cairo, Egypt.—Copies of contract from Royal Egyptian Legation, 75, South Audley Street, London, W.1. May 1.

EXPERIENCED TECHNICAL CHEMIST for examination of waters, soaps, greases, lubricants and general materials. For further details see advertisement, p. xxviii.

The Institute of Chemistry

Annual General Meeting in London

At the annual general meeting of the Institute of Chemistry held at 30, Russell Square, London, Dr. Harold G. Colman presided in the absence of Professor Arthur Smithells, who is at present on a visit to South Africa.

Report and Accounts

The report of the Council and the annual accounts were received and adopted. The roll of membership of the Institute at the end of January consisted of 1,855 Fellows and 3,703 Associates, in addition to nearly 700 registered students. The assets of the Institute were valued at over £18,500, not including special funds and the value of its premises and contents. The report showed that the Council had been active during the year in the interests of the profession, and that many interesting papers had been read and discussions held by the local sections both at home and in the overseas dominions.

The Meldola Medal for 1928 was awarded to Dr. John Alfred Valentine Butler; the Sir Edward Frankland Medal and Prize to Mr. Cyril Fryer; and the Pedler Scholar for the year is Mr. George Morrison Moir.

President's Address

The Chairman read an address from the President, in the course of which he commented on the progress of professional organisations, such as the Institute, their importance to the professions concerned, and their place in the affairs of the country. The standards of attainment set by the Institute, he said, must, unfortunately, always cut off from professional recognition a considerable number of those who aspired to it. Such persons might think these standards too exacting, but that did not necessarily debar them from the calling of chemist, and they might yet carry a marketable and a useful quota of chemical attainments. Speaking, however, for himself, and not as President of the Institute, he considered that the notion of making chemistry a closed profession was entirely impracticable. He hoped that, so far as any proposal for registration was concerned, means would be found for dealing with the special needs of the profession of chemistry, bearing in mind that the Institute had been definitely entrusted with the duty, and already afforded the means of maintaining a register of chemists on which the Government, industry, and the public increasingly relied. He was anxious, in any event, to ensure that the Institute should not be suspected of any unsympathetic attitude towards those outside its ranks who could usefully pursue a chemical calling. He had known nothing in the councils of the Institute to give the least ground for any such suspicion.

Misuse of the Title "Chemist"

Few people could have had a better opportunity than he had of seeing the mischief that could be wrought by the misuse of the title "chemist." He was not referring to the standing misfortune of being confused with members of the profession of pharmacy; but he was thinking especially of the view held by some industrialists who had got so far as to understand that there was another kind of chemist than the pharmacist, but had little conception as to what that kind of chemist should be. They knew that the chemist had some industrial value; they knew that he could analyse and could evaluate what they had to buy and sell; and they knew that his analytical craft could be acquired and bought on very reasonable terms; but from direct knowledge he could still say that some industries were being seriously handicapped by the name of "chemist" being taken in vain. He hoped, however, that those concerned with chemistry would preserve the freedom, variety, and flexibility that characterised our British ways.

The Institute had every variety of chemist within its ranks and was truly representative of the profession. Its primary purpose was to be of public service, and the State looked very frequently to it for information and advice. It was becoming more and more recognised as the body which could speak authoritatively on all chemical matters within its province. It was a living and growing thing, unconstrained by the rigidity of what is called machinery, and those who had sat at its Council table knew that its work was pervaded by commonsense and warmed by human feeling.

Officers for 1929-30

The Officers and Council for the ensuing year were elected as below:—

President: Professor Arthur Smithells.

Vice-Presidents: Mr. Arthur J. Chapman, Dr. G. C. Clayton, M.P., Mr. Ernest M. Hawkins, Professor G. G. Henderson, Dr. R. H. Pickard, and Professor J. F. Thorpe.

Hon. Treasurer: Mr. Patrick H. Kirkcaldy.

Members of Council: Dr. T. Lewis Bailey, *Mr. E. R. Bolton, Professor A. A. Boon, Dr. P. E. Bowles (North-East Coast and Yorkshire), *Mr H. B. Brown, Lieut.-Colonel S. W. Bunker (Overseas Dominions), Dr. F. D. Chattaway, Dr. William Clayton, Dr. R. T. Colgate, Mr. F. G. Edmed, Mr. G. D. Elsdon, Mr. Lewis Eynon (London and South-Eastern Counties), *Professor C. S. Gibson, Dr. W. H. Gibson, Mr. C. M. W. Grieb (Wales and the County of Monmouth), *Mr. F. W. Harris (Glasgow and West of Scotland), *Dr. John Hawthorne (Northern Ireland), *Professor T. P. Hilditch, Dr. H. H. Hodgson, Mr. Bernard F. Howard, *Mr. G. Nevill Huntly, Professor C. K. Ingold, Dr. D. W. Kent-Jones, *Dr. J. G. King, Dr. L. H. Lampitt, Dr. A. G. G. Leonard (Irish Free State), *Dr. H. Levinstein, Mr. William Marshall (Manchester and District), *Dr. H. McCombie, Mr. C. Ainsworth Mitchell, Mr. E. H. E. Monk (Liverpool and North-West Coast), Dr. Alfred Rée, Mr. P. W. Tainsh, Dr. D. F. Twiss (Birmingham and Midlands), Mr. Oliver Trigger, *Dr. William Wardlaw, Mr. J. Adam Watson (Edinburgh and East of Scotland), Mr. A. W. M. Wintle (Bristol and South-Western Counties), *Professor F. J. Wilson. *Not serving during the session 1928–29.

"Grid" System for Gas

Statement by Sir Alexander Walker

At a luncheon at the Birmingham section of the British Industries Fair on Thursday, February 28, Sir Alexander Walker, who was recently appointed chairman of a sub-committee of the National Fuel and Power Committee, said investigations were now being made as to the technical and economical aspects of the area gas supply system of the country. The central idea was, he said—if the scheme was considered by the experts to be practicable—to provide in Great Britain for the widespread distribution of gas drawn, not only from the municipal company and private gas undertakings, but from the coke ovens of the great industrial corporations. It was proposed to set up a grid system similar to that in the national electricity scheme. The committee hoped to be able to issue a report in about a year's time. The scheme under consideration was the application to this country of a system similar to that which was already in practice in the Ruhr district, where it had proved satisfactory. Under this scheme the gas given off by the coke ovens in the coal-fields and iron and steel works would be collected and passed through a system of mains to the various centres of consumption. On reaching these centres it would be fed into the tanks of the municipal gas works as an addition to the supply produced by them. Consumers would draw their gas from the usual source. There were already a number of works which were individually sending the gas produced in their ovens through single pipes to the neighbouring municipal gas companies. Under the new scheme all these sources of production would be organised into a large system. All consumers, whether for commercial or private purposes, would benefit equally from any decrease in the price of gas under the system.

Close of the British Industries Fair

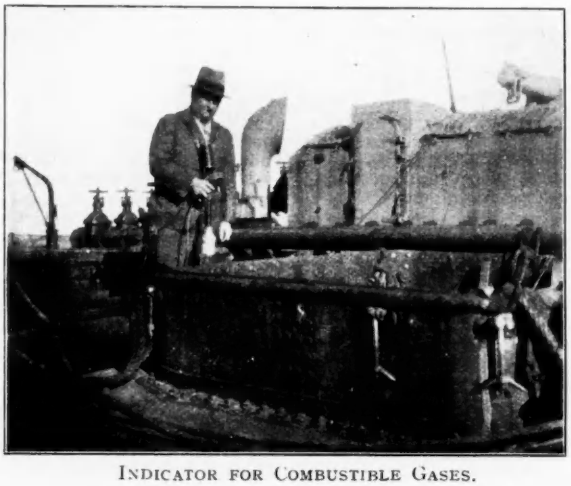
Over 140,000 people visited the London section of the British Industries Fair, which closed on Friday, March 1. The attendance of overseas buyers, home buyers, and the public was a record. Mr. R. C. Rodgers, president of the Birmingham Chamber of Commerce, stated that the amount of actual business done at the Birmingham section of the Fair was entirely satisfactory, and that the number of trade inquiries was largely in excess of last year. Already many of the exhibitors had applied for increased space for the display of their goods at the Fair next year.

Indicator for Combustible Gases

A United States Invention

THE Union Carbide Sales Co., 30, East 42nd Street, New York City, will presently place on the market a portable instrument that detects immediately the presence of a wide range of combustible gases or vapours and indicates whether or not the atmosphere containing these gases is safe to breathe and safe for flames or fire. This device was first developed by the engineers of the Union Carbide and Carbon Research Laboratories for the detection of methane or firedamp in coal mines. The methane indicating detector has successfully passed the tests of the United States Bureau of Mines, and has received its approval as permissible equipment for use in methane and air mixtures. The indicator utilises the effect of combustion of inflammable gas and air mixtures on the surface of a heated filament. This combustion increases the temperature, and consequently the electrical resistance, of the filament. This change in resistance causes the needle of a meter to move over a scale, from which the desired information relative to gas conditions is obtained.

The scale is of a type that will make the instrument equally useful to the average workman or to the industrial chemist and safety engineer. For the operator who desires to know the percentage of a known combustible gas present in a mixture of that gas and air, the meter scale reading is taken and then referred to the particular curve or chart relating to that gas.



INDICATOR FOR COMBUSTIBLE GASES.

From the curve chart the operator reads directly the percentage of gas present corresponding to the scale reading of the meter. If an unknown mixture of gases exists, and the operator desires to know whether or not the mixture is explosive, the meter scale reading is taken and referred to a "Per Cent of Explosibility" curve. Especially for those concerned with gas testing in and about oil tankers, oil and gasoline storage tanks, tank cars, oil refineries, and the like, the scale is also divided into a white section and a red section. If the meter needle comes to rest anywhere in the red section an atmosphere containing 0·2 per cent. or more of combustible gas (expressed as pentane vapour) is indicated, showing that the atmosphere is unsafe to breathe without gas masks and unsafe for any work that requires heat or fire or is liable to emit sparks. If the meter needle comes to rest in the white section, less than the equivalent of 0·2 per cent. of pentane is present, and hot repair work may be done, provided that all other regulations and precautionary measures have been followed.

The makers claim the following important features for the indicator:—Sampling and laboratory analysis are eliminated, indications are immediate, explosive mixtures of gas and air are vividly indicated by continual oscillation of the meter needle, guesswork is eliminated as readings are direct and accurate, continuous observations may be made while men are working in gaseous atmospheres, all accessible parts of tanks or compartments can be thoroughly tested for gas pockets, the detector head may be lowered into a tank while the operator remains outside, the entire outfit is safe to operate in all gas-air mixtures except those containing acetylene or hydrogen, the apparatus is entirely self-contained and not dependent on any non-portable source of power, and since the platinum filament does not operate catalytically it is not subject to the deleterious effects of sulphur compounds.

The indicator has been found to operate satisfactorily and safely in explosive mixtures of the following gases and vapours: Methane, ethane, propane, butane, pentane, hexane, gasoline, ethylene, propylene benzene (benzol), acetone, toluol, ethyl ether, methyl alcohol, ethyl alcohol, propyl alcohol, butyl alcohol, amyl alcohol, hydrogen sulphide and carbon bisulphide.

Institution of Chemical Engineers

Arrangements for Annual Corporate Meeting

ANNOUNCEMENT is made of the programme of the seventh annual corporate meeting of the Institution of Chemical Engineers. The meeting will occupy the whole of Wednesday, March 20, and will be held at Grosvenor House, Park Lane, London, under the chairmanship of the president, Sir Alexander Gibb.

The proceedings will open at 11.30 a.m. with the business session, to which only members of the Institution are admitted. Non-members are, however, invited to attend the delivery of Sir Alexander Gibb's address, which follows at 12.15 p.m. Sir Alexander has on various occasions spoken on the desirability of a closer union between the many engineering institutions, and he is taking this opportunity to develop the theme under the title of "The co-ordination of engineering institutions and societies." The address promises to be one of great interest.

After lunch, at 2.15 p.m., Professor B. P. Haigh, of the Royal Naval College, Greenwich, will read a paper on "Chemical action in relation to fatigue in metals." He has made a special study of this subject for many years, and the synopsis of the paper shows that this communication will be one of considerable importance. Non-members of the Institution may obtain advance proofs on application to the honorary secretary.

Sir Alexander Gibb Vacating Office

The meeting will close with the annual dinner in the evening, this being the last function before Sir Alexander Gibb vacates the office of president, in which he has done so much for the Institution in the last two years. The chief guest will be Viscount Chelmsford, who, as chairman of the College Committee of University College, London, has been prominently associated with the development of the Ramsay Memorial Laboratory of Chemical Engineering. The tickets are 12s. 6d. each, exclusive of wine, but including gratuities, and early application will be welcomed.

Chemical Workers' Claim Heard

THE Industrial Court, sitting in private at Westminster on Wednesday, heard a claim by the National Union of Drug and Chemical Workers for a revision of the wages and working conditions of about 20,000 workers in the industry throughout the country. The union asked for a reduction of weekly hours from forty-eight to forty-four; a revision of grading definitions for process workers and packers, and increases of wages ranging from 7s. to 3s. 6d. a week. The award of the Court will be issued in a few days.

Dr. Clayton Recovering

DR. G. C. CLAYTON, Unionist Member of Parliament for Widnes, and a member of the board of I.C.I., was taken suddenly ill and fell against the Speaker's chair in the House of Commons on Tuesday evening. He cut his head in falling. After receiving medical attention from Colonel Fremantle and Dr. Vernon Davies, Dr. Clayton was able to go home with his wife, who was in the ladies' gallery at the time. On inquiry at his house, we are informed that he is much better, and hopes to be about again shortly.

The Chemistry of Polysaccharides

Recent Advances in Our Knowledge

At the meeting of the London Section of the Society of Chemical Industry, on Monday, at Burlington House, Professor A. R. Ling gave a lecture entitled "Recent Advances in the Chemistry of Polysaccharides and Allied Compounds." Professor Ling stated at the outset that although that rather comprehensive title had been given to the lecture when he first promised to give it some time ago, he did not propose to speak on such a wide subject. He proposed only to deal with regard to two matters—starch and glycogen.

Amylose and Amylopectin

Recent work in this connection, he said, indicated the differences between starch found in foliage and leaves, and starch in its more permanent form as granules. Some starches consisted of two substances—namely, amylose and amylopectin—and the proportions of these two substances in various kinds of starches were given as follows:—Wheat, 67·2 and 32·8; potato, 66·3 and 33·7; barley, 68·2 and 31·8; and rice, 66·2 and 33·8.

These results indicated clearly that amylose and amylopectin were present in the starch in a constant ratio of 2 : 1, although, of course the list given was by no means complete. Some foreign chemists disagreed with this ratio, and put it the other way round—namely 1 : 2.

Professor Ling then described in considerable detail some of his recent work in this connection, and indicated the support there was for the view that amylo-pectin and glycogen were identical.

Dr. F. W. Norris read a paper entitled "Recent Researches on Pectous Substances."

Discussion

Mr. Julian L. Baker recalled the many discussions on starch that had taken place years ago, when he and Professor Ling were associated. Although he was not sure that he saw eye to eye with Professor Ling in all that he had said that evening, there was little doubt as to the immense value of the work that he and his colleagues were doing in creating interest once more. With regard to amylose and amylopectin, his own view was that if starch could be split up definitely into these two bodies, as suggested by Professor Ling, it was a little remarkable that different workers had recorded such varying values for these bodies as had been shown by Professor Ling's figures, which showed variations of from 66 per cent. to 80 per cent. of amylose and 33 per cent. to 20 per cent. of amylopectin.

Hulton and himself read a paper before the British Association last year in which they dealt with malted oats. Curiously enough the enzymes of the ungerminated seed took starch entirely to maltose, and he would like to put it to Professor Ling whether it was not perfectly justifiable to regard starch as a simple molecule consisting of condensed residues of maltose. The maltose in those experiments was obtained in a crystalline condition, and yields varying from 95 to 99 per cent. of starch from maltose were obtained.

Professor Ling, briefly replying to the discussion, said that the great discrepancy in the relative quantities of amylose and amylopectin mentioned by Mr. Baker was a fact, but the reason for it was that the different workers employed different methods. As to the work described by Mr. Baker in his British Association paper, he doubted very much whether crystalline maltose could be obtained from the action of malt diastase on starch. As to starch estimations, the Horace Brown method was in fairly extensive use, and he would be pleased to demonstrate it to anybody who cared to come to him at Birmingham.

Mexborough Water-softening Plant

A water-softening plant was opened on Thursday, February 28, at Mexborough, Yorkshire. The water undertaking which the Urban District Council acquired at Ludwell Springs supplies abnormally hard water. The plant is of the Permutit type. The water is pumped through large cylinders containing Permutit material, which makes the water 20 deg. softer. The plant, which is only the second in the world to be installed by a civic authority, is capable of dealing with half a million gallons a day. The cost was £2,580.

Chemical Notes from Westminster

Questions in the House

The Gallery, Westminster.

The Civil Estimates submitted to the House of Commons (February 27) included £160,000 to the Department of Scientific and Industrial Research, and a subsidy to the British beet sugar industry of £1,000.

In reply to a question by Sir A. Sinclair (February 28) as to whether it is proposed to make provision in the next financial year for the erection of a new physics building at the National Physical Laboratory, it was stated that funds were voted for this purpose for expenditure during the current financial year and work was actually begun last month.

Questions in the House (March 4) elicited the information that the London Section of the British Industries Fair was attended by 114,710 buyers against 106,280 last year, and by 32,728 members of the public, against 28,484 last year. The Birmingham figures are not yet available. The amount of business done is regarded as satisfactory, and the inquiries were in excess of any previous total.

To further questions relating to the protection of the civil population against gas attack (March 4), the Prime Minister repeated his former assurance that the problem is being closely studied in all its aspects. Further work, however, remains to be done before any scheme can usefully be recommended to local authorities.

The sniping at the Government over the Dead Sea salts concession continues. In reply to Miss S. Lawrence (March 4), Mr. Ormsby-Gore admitted that in the draft contract submitted for works in connection with the concession to Mr. Novomeysky for the exploration of the Dead Sea no fair-wage clause was inserted. Any concession that may be granted would be subject to future legislation of a general character affecting conditions of employment in Palestine and Trans-Jordan; but he did not think that the Governments of those territories could require any particular concessionaries to accept special labour conditions not imposed by law upon other employers. "Is it a fact," asked Miss Lawrence, "that there is no fair-wage clause of any kind in the contracts issued on behalf of the Palestine Government? "Yes," replied Mr. Ormsby-Gore, "in all Government undertakings there are clauses of that kind, but in the ordinary enterprise that takes place in that country as yet there is no such limitation."

Major Glyn asked what was the date when the first application was made to the Colonial Office for the necessary permission by certain British subjects to obtain leave to develop the salt deposits of the Dead Sea; whether the Government of Palestine have expressed their anxiety that this new source of revenue should be made effective; and what are the reasons for the delay in granting the concession?

Mr. Amery replied that the first person to approach H.M. Government, so far as he was aware, was Major Tulloch, in January, 1918. It was not possible to deal actively with the question until much later. Everyone concerned was anxious that the natural resources of the Dead Sea should be properly developed; but many points of detail had had to be discussed with the Palestine and Trans-Jordan Governments before any decision could be reached. The final observations of these Governments were not received until the end of January last.

Analysts' General Meeting

The annual general meeting of the Society of Public Analysts was held on Wednesday at Burlington House, London. The officers for the coming year were elected as follows: President, E. Hinks; past-presidents on the council, E. R. Bolton, A. Chaston Chapman, Bernard Dyer, P. A. Ellis Richards, G. Rudd Thompson, E. W. Voelcker, and J. A. Voelcker; vice-presidents, John Evans, J. T. Hewitt, and T. Macara; treasurer, E. B. Hughes; hon. secretary, F. W. F. Arnaud; council, A. P. Davson, J. T. Dunn, N. Evers, D. C. Jones, R. Lessing, G. Roche Lynch, A. More, W. Partridge, C. A. Seyler, C. J. H. Stocks, J. R. Stubbs, and G. Taylor.

From Week to Week

DR. A. E. DUNSTAN has been elected president of the Institution of Petroleum Technologists.

MR. T. L. GARNER, for 2½ years chemist with the Avon India-rubber Co., has been appointed research chemist to the company.

LORD MELCHETT has returned to London from the South of France. Lady Melchett has gone to Cap Martin from Monte Carlo for convalescence.

THE HON. JAMES WEIR, elder son of Lord Weir (chairman of Monel-Weir, Ltd., and a member of the board of I.C.I.), was married on Saturday, March 2, at Ottawa, to Miss Lucy Crowdy.

MR. S. B. BROOKES, a chemist employed at the Kelham (Notts) beet sugar factory, dived 40ft. from Kelham Bridge to the rescue of a woman who fell from the parapet into the river, and succeeded in saving her life.

SYNTHETIC AMMONIA AND NITRATES, LTD., have received permission from the Billingham Urban District Council to make emergency dumps for anhydrite and for boiler slack and coke on the Billingham Bottoms.

THE T. W. RICHARDS MEMORIAL LECTURE of the Chemical Society will be delivered by Sir Harold Hartley, F.R.S., on April 25, at 5.30 p.m., at the Institution of Mechanical Engineers, Storey's Gate, Westminster, London.

DR. STRESEMANN announced at Geneva on Monday that Germany would ratify the Protocol prohibiting the use of poison gas in war time. This is a confirmation of the official announcement on the subject made last year by the German Government.

MR. A. T. GRISENTHWAITE, of the Power Gas Corporation, said in the course of an address to the Stockton Rotary Club, on Saturday, March 2, that the water gas plant at the Billingham works of Synthetic Ammonia and Nitrates was the largest in the Empire.

WILLIAM W. CHAPMAN, managing director of the South Wigston Dyeworks, was charged at Leicester on Saturday, March 2, with embezzling £50 from that company, and it was stated that further charges would be preferred involving a total of about £700. A remand was ordered for a week, bail being allowed.

MR. T. TICKLE, F.I.C., public analyst for the county of Devon, has been appointed by the Minister of Health as member of an advisory committee "to consider and report upon questions as to the definition of drugs or medicines for the purposes of medical benefit under the National Health Insurance Acts."

THE I.G., according to a statement made at its recent meeting, now has 114,000 employees, as against 108,000 a year ago. The company is planning the erection of a centralized administration building at Frankfort-on-Main, at an estimated cost of 15,000,000 marks. The structure will not be completed before the middle of 1930.

CAPTAIN E. T. STERNE, of Brantford, Canada, who may be remembered as representing Shawinigan chemical interests in London some years ago, has been elected president of the Ontario Association of Professional Engineers, being the first chemical engineer to occupy that position. He had previously served on the Council of the Canadian Institute of Chemistry, of which he is a Fellow.

A NEW HYBRID PLANT has been developed by Mr. Leonard Browning, as the result of much experimental work, which will, it is claimed, produce fibre for textile purposes, wood-cellulose for paper making, and seed for the manufacture of cattle food. The plant, known as "Brotex," is being grown on a farm in the south-west of England. Sir George Courthope is chairman of the company formed to exploit it.

CHEMICAL AND METALLURGICAL CORPORATION, LTD., announce that Sir Frederick Mills, the chairman, has resigned from the board, and that Mr. Walter McDermott and Mr. Atkinson Adam have asked to be relieved of their duties owing to increased calls on their time. In the place of Sir Frederick Mills, Dr. E. P. Andreae has been elected chairman, and Mr. Francis Arnatt has been appointed joint managing director to act with Mr. Stanley Smith.

THE BRITISH ALUMINIUM CO., LTD., of Adelaide House, King William Street, London, E.C.4, have opened a new branch office and warehouse at 66, Kirkstall Road, Leeds, under the management of Mr. C. F. Batstone. As at the London, Birmingham, Newcastle, and Glasgow warehouses, aluminium will be stocked in all of the company's standard forms—ingot and semi-manufactured. The new telegraphic address is "Aluminium, Leeds" and the telephone number "Leeds 28343."

TRIETHANOLAMINE has been put on the market in the United States by the Carbide and Carbon Chemicals Corporation. The product as marketed consists of a mixture of 70–75 per cent. triethanolamine, 20–5 per cent. diethanolamine, and ½ per cent. monoethanolamine, b.p. 277° C./150 mm. Its properties resemble those of glycerin and glycol, but it is more hygroscopic than these. With fatty acids it forms soaps which are readily soluble in water, oil and petroleum, and on this account it is suitable for the preparation of shaving soaps and face creams, as well as drilling oils and synthetic resins. Addition of triethanolamine to organic liquids enhances their power of impregnating textiles and wood. By nitration it may be converted to explosives.

EXPORTS OF INDIGO FROM INDIA during 1928 totalled 1,053 cwt., as compared with 1,835 and 2,005 cwt. in 1927 and 1926 respectively.

A COMPANY is now in course of formation for the exploitation of new discoveries of asbestos deposits which have been made in Cyprus.

GERMAN EXPORTS of ammonium sulphate amounted in 1928 to 837,257 tons (162 million marks), an increase of 168,189 tons (24 million marks) on 1927.

MR. ROBERT MOND who, last week, made a gift of £8,000 to the French Maison de la Chimie, has now forwarded to Lord Crewe a cheque for £1,000 as a donation towards the British Institute in Paris.

THE BOARD OF TRADE have appointed Mr. Forrest Hewit, of the Calico Printers' Association, Ltd., to be a member of the Dyestuffs Industry Development Committee, in place of Mr. W. H. Dixon, resigned.

AN INQUIRY is being held into the causes of an explosion and fire which occurred on Monday at Woolwich Arsenal. Most of the twenty-two persons injured are progressing favourably. Employment in the Arsenal has in no way been interfered with.

RECENT WILLS INCLUDE: Mr. John Robertson Lauder, of Glasgow, chemical merchant (personal estate in Great Britain), £16,300. Dr. Charles Robert Young, of the Department of Scientific and Industrial Research, £1,784 (net personalty £1,560).

FOLLOWING upon recent deliberations between the Newcastle section of the Institute of Chemistry and the Newcastle and Gateshead Chamber of Commerce, a local industrial research advisory committee is stated to be in course of formation.

DR. A. PARKER, hitherto gas research chemist in the Department of Coal Gas and Fuel Industries of the University of Leeds, has resigned in order to take up a responsible post with the water pollution section of the Department of Scientific and Industrial Research.

AT AN INQUEST, on Wednesday, February 27, on Richard Ralph, a chemical labourer employed at the British Dyestuff Corporation's beta-naphthol plant, Dr. Copland, the police surgeon, attributed death to acute bronchial pneumonia. The jury returned a verdict of death from natural causes in accordance with the medical evidence.

"B. AND L." POWDERED FUEL LTD. have issued to the shareholders a circular stating that a British patent has now been issued to the company, which covers a complete system of bunkering and unbunkering powdered fuel with inert gases, whether on land or sea, and which renders the handling of all classes of powdered fuel absolutely safe from risk of spontaneous combustion or explosion.

THE MARKING of a variety of foreign-made imported rubber goods (including rubber in sheets, valves, hose and tubing) with an indication of origin is recommended by the standing committee of the Board of Trade, whose report, after the recent inquiry, has just been issued. The Order-in-Council is recommended to come into operation three months after it is made. Marking applies only to time of sale.

ATHOLE G. ALLEN AND CO., chemical manufacturers, Prince's Wharf, Westminster, announce that they have recently taken over the chemical works at Stockton-on-Tees which were previously worked by a company known as the Stockton-on-Tees Chemical Works, Ltd. These works are producing very high grade qualities of iron perchloride (ferro chloride), ferrous chloride, iron oxide, and barium nitrate, and it is intended to add to the list of products shortly.

THE AMERICAN CHEMICAL SOCIETY has added to its official publications an "Analytical Edition" of *Industrial and Engineering Chemistry*, to be issued quarterly on the 15th of January, April July, and October. "The contributions of analytical chemistry," it is stated in a foreword in the first issue, "may not be appreciated by the plant manager, nor by the director of the laboratory, nor by the chief of the bureau, but every chemist knows to what extent we depend on accuracy in this field."

Obituary

MR. CHARLES DORMAN, director of Dorman, Long and Co., at Middlesbrough, on February 28, aged 54.

DR. C. LAAR, professor of chemistry at Bonn University, author of numerous papers on isomerism and tautomerism, aged 76.

DR. H. BRUCKMANN, of Berlin, who was engaged in financing new technical processes (especially the Bergius process of coal liquefaction), on February 26, aged 56.

MR. L. CAMPBELL-JOHNSTON, founder of the Vine Products Co., on February 28, aged 65. He was responsible for the establishment and development of the artificial sunlight clinic of the British Humane Association.

DR. T. POSNER, professor of chemistry at Greifswald University, Germany, on March 2, aged 58. He carried out investigations on unsaturated compounds, dyestuffs of the indigo group, etc., and published a text book of organic synthetic methods.

MR. RICHARD WHITE, at Newcastle, aged 73, recently. He joined the firm of McCallum, Smith and Co., chemical merchants, in 1870, and in 1886 commenced business as a chemical and general export merchant in partnership with the late Mr. J. G. Day, as Day and White, the firm subsequently adopting the title of Richard White and Co.

References to Current Literature

British

APPARATUS.—A new apparatus for autographic records of the strength and elongation of textile fibres and yarns. S. G. Barker and N. Tunstall. *Trans. Faraday Soc.*, March, pp. 103–108.

GENERAL.—The colour of light sources. Carbon arcs. I.—Introduction and summary. P. W. Cunliffe and H. Lanigan. *J. Textile Inst.*, February, pp. 21–30 T.

The colour of light sources. Daylight lamps. I.—Introduction. P. W. Cunliffe and H. Lanigan. *J. Textile Inst.*, February, pp. 31–33 T.

The colour of light sources. Sunlight and skylight I.—Introduction and summary. P. W. Cunliffe. *J Textile Inst.*, February, pp. 34–46 T.

The decomposition of nitrous oxide in the silent elec. tric discharge. II.—S. S. Joshi. *Trans. Faraday Soc.*- March, pp. 108–117. III.—The variation of the cur, rent and of the power during the reaction. S. S. Joshi- *Ibid.*, pp. 118–128.

WOOL.—The rigidity of wool and its change with adsorption of water vapour. J. B. Speakman. *Trans. Faraday Soc.*, March, pp. 92–103. The reduction of rigidity is caused by water adsorption on particular groups in the wool molecule, but the simplicity of the rule is marked by the fact that water can be adsorbed in two other additional ways.

United States

ANALYSIS.—The determination of traces of iodine. II.—Iodine in vegetables. J. F. McLendon and R. E. Remington. *J. Amer. Chem. Soc.*, February, pp. 394–399.

Gravimetric method for the micro determination of molybdenum. J. B. Niederl and C. P. Silbert. *J. Amer. Chem. Soc.*, February, pp. 376–377.

CHEMICAL ENGINEERING.—Estimating heat consumed in the batch rectification of alcohol. G. S. Houghland. *Chem. and Met. Eng.*, February, pp. 89–91.

Improving fractionation for cracking processes. D. B. Keyes. *Chem. and Met. Eng.*, February, p. 78. Two improved arrangements that may be applied to the Dubbs and the Holmes-Manley processes.

Are present cylinder test regulations practicable ? G. D. Bagley. *Chemical Markets*, February, pp. 169–175.

CORROSION PREVENTION.—Surface films protect metals against corrosion. F. N. Speller. *Chem. and Met. Eng.*, February, pp. 85–87.

GENERAL.—Chlorine in the fields of sanitation. L. H. Enslow. *Chemical Markets*, February, pp. 145–147. Water chlorination ; chlorine in the realm of coagulants ; treatment of shellfish with chlorine.

Crystal growth in aqueous solutions. II.—Experimental. W. L. McCabe. *Ind. and Eng. Chem.*, February 1, pp. 112–119. The theory of crystal growth presented in a previous paper is verified experimentally with potassium chloride and copper suplhate. Ten variables that might influence the process are investigated.

Supermolecular state of polymerised substances in relation to thin films and interfaces. S. E. Sheppard, A. H. Nietz, and R. L. Keenan. *Ind. and Eng. Chem.*, February 1, pp. 126–127.

ORGANIC.—The nitration of substituted anilines. E. R. Riegel, H. W. Post, and E. E. Reid. *J. Amer. Chem. Soc.*, February, pp. 505–508.

The polyhydric alcohol-polybasic acid reaction. I.—Glycerol-phthalic anhydride. R. H. Kienle and A. G. Hovey. *J. Amer. Chem. Soc.*, February, pp. 509–519.

Synthesis of ephedrine and structurally similar compounds. I.—A new synthesis of ephedrine. R. H. F. Manske and T. B. Johnson. *J. Amer. Chem. Soc.*, February, pp. 580–582.

The preparation of certain chloro and bromo derivatives of 2 : 4-dihydroxydiphenyl-methane and -ethane and their germicidal action. E. Klarmann and J. V. Wowern. *J. Amer. Chem. Soc.*, February, pp. 605–610.

SYNTHETIC AMMONIA.—How the Mont-Cenis process produces ammonia. R. Battig. *Chemical Markets*, February, pp. 148–150.

WAX.—The waxes of industry. J. R. Sanderson. *Chemical Markets*, February, pp. 141–144.

German

ANALYSIS.—The determination of starch by means of the interferometer according to O. Wolff. B. Elema. *Zeitschrift angewandte Chem.*, February 23, pp. 199–201.

A method of determining formaldehyde. F. Lippich. *Zeitschrift analytische Chem.*, Vol. 76, Part 7-8, pp. 241–254.

A rapid method for the determination of mercury. G. Spacu and J. Dick. *Zeitschrift analytische Chem.*, Vol. 76, Part 7–8, pp. 273–277.

The potentiometric determination of titanium in the presence of other metals, especially iron. H. Brintzinger and W. Schieferdecker. *Zeitschrift analytische Chem.*, Vol. 76, Parts 7–8, pp. 277–280.

CELLULOSE, ETC.—Hydrolysis experiments with acetyl cellulose. D. Krüger, *Melliand Textilberichte*, March, pp. 208–211.

CORROSION.—Bitumen as a means of protection against corrosion in the chemical industry. A. W. Rick. *Chemische Fabrik*, February 27, pp. 100–101.

DYEING.—New investigations on the theory of acetate silk dyeing. H. Brandenburger. *Melliand Textilberichte*, March pp. 215–217.

The fastness to washing of acetate silk dyeings. H. Brandenburger. *Melliand Textilberichte*, March, pp. 227–228.

GENERAL.—The elimination of tar fogs from gases. A. Fischer. *Chemische Fabrik*. February 27, pp. 101–102.

Iodine in the soil and in plants. R. Köhler. *Zeitschrift angewandte Chem.*, February 23, pp. 192–197.

Chemical nonsense in popular literature. H. Wagner. *Zeitschrift angewandte Chem.*, February 23, pp. 197–199.

Pitch and tar : An important chemo-economic problem. W. A. Dyes. *Chemiker-Zeitung*, February 23, pp. 158–159.

INDUSTRIAL WELFARE.—Industrial accidents in the chemical industry and means for their prevention. Dr. Witt. *Chemische Fabrik*, February 27, pp. 97–98.

More interest in the protection of the worker ! H. Grossmann. *Chemische Fabrik*, February 27, pp. 99–101.

The real significance of industrial dangers for the chemical industry. P. Reiwald. *Zeitschrift angewandte Chem.*, March 2, pp. 217–219.

Accident- and disease-prevention in the chemical industry. Dr. Rheinfels. *Zeitschrift angewandte Chem.* March 2, pp. 220–228.

Recent investigations on the relations between dust and diseases of the lung. G. Wolff. *Zeitschrift angewandte Chem.*, March 2, pp. 228–232.

MILK.—Experiences with physical methods in the investigation of milk. J. Krenn. *Zeitschrift angewandte Chem.* February 23, pp. 202–204.

TECHNIQUE.—Physical methods in the chemical laboratory. IX.—The application of the radioelements as indicators. F. Paneth. *Zeitschrift angewandte Chem.*, February 23, pp. 189–192.

Miscellaneous

ANALYSIS.—A new colorimetric method of determination of nitrates in soils and waters. L. U. de Nardo. *Comptes Rendus*, February 18, pp. 563–565 (in French).

GENERAL.—The synthesis of cyanamide by reaction between carbon and calcium nitride. M. Kadlec-Fleck. *Comptes Rendus*, February 18, pp. 559–561 (in French).

Equilibrium between water, sodium, nitrate, and sodium chloride. A. Chrétien and E. Cornec. *Comptes Rendus*. February 25, pp. 628–631 (in French).

ORGANIC.—The constitution of nodakenin, a new glucoside from *Peucedanum decursivium Maxim.* I.—J. Arima. *Bulletin Chem. Soc. Japan*, January, pp. 16–20 (in German).

The acetylation of carbohydrates with acetic anhydride and alkali thiocyanate. Y. Tsuzuki. *Bulletin Chem. Soc. Japan*, January, pp. 21–23 (in German).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

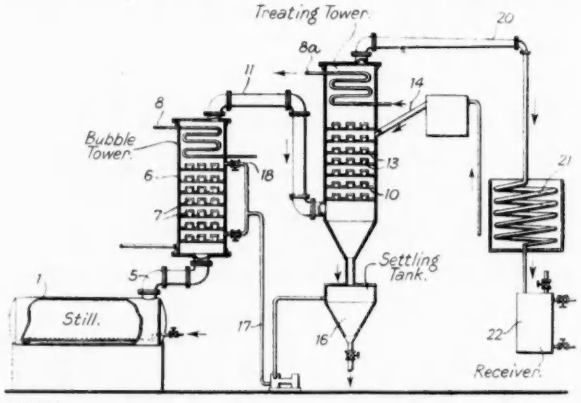
Abstracts of Complete Specifications

305,082. Vat Dyestuffs of the Anthraquinone Series. Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 26, 1927.

These dyestuffs are obtained by the action of sulphuric acid of comparatively low temperature on a 1:1 -or a 2:1 -dianthraquinonyl-amine containing at least one acridone ring in the 3(CO); 4(NH)-position and in addition at least one acylamino group or a derivative or substitution product. The dianthraquinonyl amines are converted into differently coloured compounds by prolonged heating of the solution in sulphuric acid to 30°—40° C. The substances may be subjected to a short treatment with sulphuric acid at a lower temperature, followed by oxidation of the intermediate product with nitrous acid to the desired end product. An example is given of the production of a vat dyestuff from the dianthraquinonyl-amine derivative obtained by the condensation of one molecule of 4-amino-1:2-anthraquinone-acridone with one molecule of 1-benzoylamino-5-chloroanthraquinone.

305,108. Treating Hydrocarbon Oil, Process and Apparatus for. C. Arnold, London. From Imperial Oil, Ltd., 56, Church Street, Toronto 2, Canada. Application date August 30, 1927.

This apparatus is for purification of hydrocarbon oils, particularly naphtha or gasoline produced by cracking. Vapour from a still 1 passes from a pipe 5 to a fractionating column 6 fitted with bell cap plates 7, and having a cooling



305,108

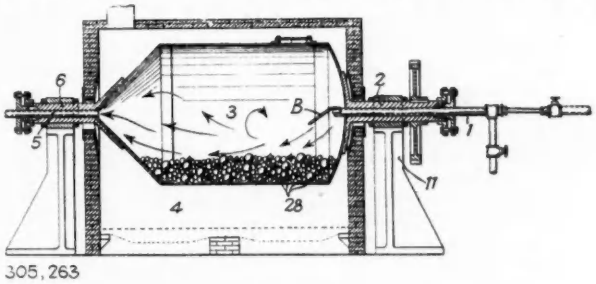
coil 8 in the upper part. The oil to be treated is supplied through a pipe 9. The vapour passes through a pipe 11 to a tower 10 containing a finely divided or foraminous absorbent and having a similar cooling coil 8A and baffle plates 13. The solid absorbent is collected in the settling tank 16, and the condensate is passed through pipes 17, 18 back to the column 6. Vapour passes through a pipe 20 to a condenser 21, and the condensate passes to a receiver 22. Suitable absorbents include Fuller's earth, and a special clay obtained in Georgia, U.S.A. The absorbent is suspended in suitable oil and supplied through pipe 14. If the oil contains a high percentage of sulphur, the clay may be associated with metallic oxides, *e.g.*, copper or iron oxide.

305,147. Aliphatic Acid Anhydrides, Manufacture of. H. Dreyfus, 8, Waterloo Place, London, S.W.1. Application date, July 30, 1927.

Aliphatic anhydrides are obtained by subjecting aliphatic acids to pyrogenic decomposition in reaction vessels constructed or lined with metals whose salts or oxides are readily reduced by the action of hydrogen. It is found that after working for prolonged periods, or on restarting the reaction, a large amount of decomposition products are formed. This may be avoided by passing a stream of hydrogen through the reaction zone during the heating or the passage of the acid vapour. The metals employed may be copper, nickel, iron, cobalt, bronze. The reaction is effected at 500°-700° C., and the vapour then subjected to fractional condensation to obtain the anhydride. Alternatively, the reaction vapours may be passed through a liquid insoluble in water, of higher boiling point than the anhydride, and solvent for the anhydride, *e.g.*, chlorbenzols, benzyl ether, tetrachlorethane, acetylglycerines, anisol, paracresylacetate, phenetol, or paraffin oil. In another method, the reaction vapours may be mixed with an entraining vapour, *e.g.*, benzene, carbon tetrachloride, or petrol, which allows the anhydride to be condensed out while carrying away the water vapour. In another method, the reaction vapour may be led into an extracting liquid kept considerably below the boiling point of water, *e.g.*, benzene, chloroform, and mixtures of ethylether or chloroform with light paraffins, gasoline, kerosene, or benzol. In another method the mixed vapours may be passed over water-binding substances such as bisulphates, pyrosulphates, zinc chloride, calcium chloride, ortho-, meta- and pyro-phosphoric acid, and other substances not having a deleterious effect on aliphatic acids or anhydrides.

305,263. Distilling or Cracking Oils and Like Carbonaceous Liquors, Process for. A. L. Rispler, 5370, Pershing Avenue, St. Louis, Mo., U.S.A. Application date, November 3, 1927.

Oil is introduced by a pipe 1 into a reaction vessel 3, and steam is introduced through a pipe L_1 passing through the oil pipe but terminating short of the inner end. Pipe 1 passes through a hollow shaft 2 carried by the vessel 3 and supported by a bearing 11. The other end of the vessel 3 is provided



305,263

with a similar hollow shaft 6, through which passes a stationary outlet pipe 5. Crude petroleum oil or coal tar is supplied through the pipe 1, and the volatile portions are immediately volatilised, while the asphaltic portions drop into the still. These fall on to a quantity of iron balls 28, so that decomposition takes place into volatile products and carbon. The carbon is pulversied by the grinding action of the iron balls so that no deposition of carbon on the inner walls takes place. The powdered carbon is periodically removed by blowing it into the outlet pipe 5 by means of steam which is deflected downwards by the baffle B.

305,308. Esters, Manufacture of. C. Arnold, London. From Standard Oil Development Co., 26, Broadway, New York, U.S.A. Application date, November 21, 1927.

In the manufacture of esters, the alcohol and acid to be esterified are brought into reaction in the presence of a reagent which is a better solvent for the ester than for the alcohol, acid, or water, and which is capable of stratifying in a separate layer. A suitable substance is a petroleum white oil product boiling above 300° C. and of 28° or 29° Bé. An example is given of the production of secondary butyl acetate from secondary butyl alcohol and glacial acetic acid, employing a small percentage of sulphuric acid as a catalyst.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they

became open to inspection under the International Convention :—280,886 (I.G. Farbenindustrie Akt.-Ges.) relating to vat dyestuffs, see Vol. XVIII, p. 85; 282,427 (Schering Kahlbaum Akt.-Ges.) relating to metal mercapto carboxylic acid esters, see Vol. XVIII, p. 183; 291,004 (Deutsche Gasglühlicht Auer-Ges.) relating to ores of zirconium, titanium, etc., see Vol. XIX, p. 85.

International Specifications not yet Accepted

303,347. Catalytic Agents. J. P. P. Mayor, 24, Rue du Valentin, Lauranne, Switzerland. (Assignee of Soc. Alsacienne de Produits Chimiques, 63, Boulevard Haussmann, Paris.) International Convention date, December 31, 1927.

Copper hydroxide is precipitated from a solution of a copper salt, and the precipitate heated in the solution until the desired degree of hydration is obtained. A stabilizing agent such as an alkaline earth, an alkali metal salt, or sugar, is added. Examples are given of the production of $6CuO.H_2O$ and $4CuO.H_2O$.

303,351 and 303,355. Nitric Acid. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, December 31, 1927.

303,351. A solution containing nitric acid and halogen acids or their salts is treated with sulphur dioxide to reduce the nitric acid to nitrogen oxides. These are washed with water or alkaline solutions and oxidised with air or oxygen to form nitric acid or nitrates or nitrites. The nitric acid may thus be separated from the halogen acids.

303,355. Potassium chloride or sulphate is treated with nitric acid and most of the potassium nitrate separated by cooling to-5° C. and filtering or centrifuging. The liquor is then treated as in 303,351 above to recover the remaining nitric acid. The residual liquor is then distilled to obtain hydrochloric acid, leaving a potassium salt.

303,366. Metal Compounds. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, December 31, 1927.

Metal compounds are precipitated from solutions by means of gaseous or liquid ammonia, or the ammonia may cause a reaction to yield a metal compound precipitated by ammonia. Caustic soda may be precipitated from solution, or may be separated from admixture with sodium nitrate; saturated sodium chloride solution may be treated with liquid ammonia, and a solution of sodium chloride in liquid ammonia may be treated with water to form and precipitate caustic soda; an ammonium compound of calcium chloride may be precipitated from calcium chloride solution; and a solution of calcium nitrate and ammonium chloride may be treated to precipitate calcium chloride.

303,375. Dyes and Intermediate Products. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, December 30, 1927.

2-α-naphthoyl-benzoic acid and its derivatives are treated with aluminium chloride in the presence or absence of an organic or inorganic melting agent at 80°–130° C. The products appear to be derivatives of dihydro-benzanthrone and do not form a vat with alkaline hydrosulphite. Higher temperatures than those mentioned would cause the formation of naphthanthraquinone. The product from 2-α-naphthoyl-benzoic acid has the formula

Details are given of the treatment of 2-α-naphthoyl-benzoic acid and 2-(1¹:-4¹-methylnaphthoyl)-benzoic acid. The products can be converted into vat dyes by fusing with caustic alkali at 230°–260° C.

303,482. Recovering Alkali Compounds from Waste Lyes. R. Winternitz, 6, Lutzowova, Prague. International Convention date, January 4, 1928.

Alkali lyes obtained in the cellulose and viscose industries are purified by adding methyl or ethyl alcohol, which precipitates the impurities, and a small amount of lead acetate which removes the colour. After filtering and distilling, quicklime is added to regenerate the caustic soda.

303,494–5. Acetic Acid. H. Suida, 33, Jubilaumstrasse, Mödling, Austria. International Convention date, January 5, 1928.

303,494. Acetic acid is extracted from its aqueous solutions by a mixture of quinoline, dimethyl-aniline, and a hydrocarbon such as anthracene oil, heavy oil, paraffin oil, spindle oil, hydrogenated naphthalene, solvent naphtha, gas oil, etc. All the constituents of the solvent must boil above 150° C.

303,495. Acetic acid is recovered from gaseous mixtures containing it by washing with a mixture as above.

303,520. Carbazole Derivatives. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, January 5, 1928.

The diazo compounds of aminocarbazoles, other than 3-amino-carbazole, are subjected to the reactions customarily employed in the case of aromatic amines. The products are hydroxy-carbazoles and their derivatives, such as ethers and esters, halogen-carbazoles, cyanocarbazoles, carbazole carboxylic acids and their derivatives, such as their esters and acid amides of the aliphatic, aromatic and heterocyclic series, also sulphur derivatives. Examples are given.

303,526–7. Dyes. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention dates, January 5 and 6, 1928.

303,526. This is an addition to 284,247 (see The Chemical Age, Vol. XVIII, p. 305). Arylides of 2 : 3-oxynaphthoic acid are coupled with mono-aroylated *m*-phenylene-diamines carrying alkyl or alkoxy groups in *o*-position to the amino groups. The aroyl groups may be derived from carboxylic or sulphonic acids, and the hydrogen of the —NH-group may be replaced by an alkyl or aralkyl residue. Examples are given.

303,527. A diazonium compound is treated with fluorsulphonic acid to obtain fluorsulphonates which are used in dyeing and as insecticides. Thus, a solution of 4-chlor-2-aminotoluene in hydrochloric acid is diazotized and treated with 40 per cent. fluorsulphonic acid.

Latest Notifications.

306,803. Catalytic hydrogenation of non-nitrogenous organic compounds. Selden Co. February 25, 1928.

306,471. Catalytic reduction of carbonyl compounds. Selden Co. February 21, 1928.

306,442. Catalytic apparatus. Selden Co. February 20, 1928.

306,519. Catalytic apparatus. Selden Co. February 23, 1928.

306,447. Conversion products of azo-dyes. Geigy Soc. Anon, J. R. February 20, 1928.

306,448. Mordant dyeing disazo dyestuffs. Geigy Soc. Anon, J. R. February 20, 1928.

306,531. Manufacture of cellulose acetate. U.S. Industrial Alcohol Co. February 24, 1928.

306,450. Process for preparing N-substituted cyano-formarylides. Deutsche Gold- und Silber-Scheideanstalt Vorm. Roessler. February 20, 1928.

306,490. Process for the manufacture of highly-active absorption carbon. I.G. Farbenindustrie Akt.-Ges. February 21, 1928.

306,492. Process for the manufacture of mercapto benzothiazoles. I.G. Farbenindustrie Akt.-Ges. February 21, 1928.

306,512. Manufacture of oxygenated hydrocarbons. Soc. L'Air Liquide, Soc. Anon. Pour L'Etude et L'Exploitation des Procedes G. Claude. February 22, 1928.

306,558. Manufacture of 2-mercapto-arylene-thiazole compounds. I.G. Farbenindustrie Akt.-Ges. February 23, 1928.

306,842. Manufacture of 2-mercapto-arylene-thiazole compounds. I.G. Farbenindustrie Akt.-Ges. February 24, 1928.

306,843. Process for the manufacture of colour lakes or pigment dyestuffs. I.G. Farbenindustrie Akt.-Ges. February 25, 1928.

306,844. Process for the manufacture of azo dyestuffs on the fibre. I.G. Farbenindistrie Akt.-Ges. February 25, 1928.

Specifications Accepted with Date of Application

280,947. Removing sulphur compounds from gas mixtures, Processes of. Silica Gel Corporation. November 19, 1926.

289,885. Purifying gases from sulphuretted hydrogen by decomposing the latter into hydrogen and sulphur, Method of. F. Fischer. May 5, 1927.

290,647. Nickel and nickel alloys, Manuafcture of. International Nickel Co. May 19, 1927.

291,347. Diacidyl derivatives of naphthalene and acenaphthene, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 30, 1927. Addition to 279,506.

301,478. Electrolytic deposition of chromium. Langbein-Pfangauser-Werke Akt.-Ges. December 1, 1927.

301,859. Solvent treatment of copper silicate ores. Anglo-American Corporation of South Africa, Ltd. December 7, 1927.

305,965. Artificial resins, Manufacture of. Imperial Chemical Industries, Ltd., R. Hill and E. E. Walker. November 11, 1927.

306,051. Alkyliso-alkylenephenols and alkylated cumaranes, Manuafacture of. Chemische Fabrik auf Actien (vorm. E. Schering), and H. Jordan. August 15, 1927.

306,052. Sulphonic acids, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). September 14, 1927.

306,054. Carrying out exothermic gas reactions and regenerating heat and cooling the walls of the said apparatus, Apparatus for. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). September 15, 1927.

306,215. Iron powder of high purity and small grain size. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). March 23, 1928. Addition to 271,016.

306,320. Corrosion-resistant ferrous alloys and method of making same. H. L. Miller. April 13, 1928.

306,352. Monocyclic lactones with 14 to 18 ring members, Preparation of. Soc. Anon. M. Naef and Cie. June 26, 1928. Addition to 294,602.

Applications for Patents

Apex (British) Artificial Silk, Ltd., and Bleasdale, H. Manufacture of cellulose acetate. 6,204. February 25.

Brightman, R., and Imperial Chemical Industries, Ltd. Manufacture of azo dyes, etc. 6,187, 6,188. February 25.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products of mercurized hydrocarbons, etc. 6,333. February 26.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 6,334. February 26.

Cross, R. Mixture of gel-forming silicate materials. 6,215. February 25.

Du Pont de Nemours & Co., E. I. Cellulose acetate compositions. 6,450. February 27. (United States, February 27, 1928.)

Electro Metallurgical Co. Case hardening by nitrification. 6,364. February 27. (United States, June 27, 1928.)

Ellis, E. A. and Soc. des Usines Chimiques Rhône-Poulenc. Manufacture of cellulose esters. 6,189. February 25.

Ellis, E. A. and Soc. des Usines Chimiques Rhône-Poulenc. Manufacture of organic acyl halogenides. 6,771, 6,772, 6,773. March 1.

Feld, G. Desulphurization of organic liquids, etc. 6,272. February 26.

Haller, P., and Kappeler, H. Manufacture of condensation products of arylamines. 6,575. February 28. (Switzerland, February 29, 1928.)

Hoffa, E., and Thoma, E. Manufacture of azo-dyestuffs insoluble in water. 6,131. February 25.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of vat dyestuffs. 6,120. February 25. (November 27, 1928.)

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of sugar solutions for fermentation. 6,121. February 25.

I.G. Farbenindustrie Akt.-Ges., and Mond, A. L. Pressure vessel for liquefied gases. 6,199. February 25.

I.G. Farbenindustrie Akt.-Ges., and Imray, O.Y. Manufacture of derivatives of 2 : 3 hydroxynaphthoic acid. 6,303. February 28.

I.F. Farbenindustrie Akt.-Ges., and Imray, O. Y. Materials for marking animals. 6,305. February 26.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of rubber, etc. 6,412. February 27.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of vat dyestuffs. 6,413. February 27.

I.G. Farbenindustrie Akt.-Ges., and Imray, O. Y. Manufacture of aralkyl-benzanthrones. 6,429. February 27.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Separation of mixtures of sulphuric acid and nitric acid. 6,565. February 28.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Softening water. 6,566. February 28.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of sulphur-bearing gases, etc. 6,839. March 2.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of butadiene. 6,840. March 2.

I.G. Farbenindustrie Akt.-Ges. Manufacture of azo-dyestuffs insoluble in water. 6,131. February 25.

I.G. Farbenindustrie Akt.-Ges. Manufacture of 2-mercapto-arylenethiazole compounds. 6,155. February 25. (Germany, February 24, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of colour lakes, etc. 6,156. February 25. (Germany, February 25, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 6,157. February 25. (Germany, February 25, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of therapeutical agents. 6,335. February 26. (Germany, February 27, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of insect glue. 6,336. February 26. (Germany, February 27, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of dyed viscose fabrics. 6,441. February 27. (Germany, February 27, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of anthraquinone derivatives. 6,446. February 27. (Germany, February 29, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of viscose. 6,574. February 28. (Germany, February 28, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial fibres. 6,736. March 1. (Germany, March 14, 1928.

Imperial Chemical Industries, Ltd. Production of water-soluble substances fron coal, etc. 6,283. February 26.

Imperial Chemical Industries, Ltd. Formation of soluble oxidation products from coal, etc. 6,284. February 26.

Imperial Chemical Industries, Ltd., and Wyler, M. Manufacture of sulphide dyes. 6,352. February 26.

Imperial Chemical Industries, Ltd. Production of water-soluble substances. 6,511. February 28.

Kato, Y., and Yamamoto, K. Manufacture of manganese dioxide. 6,324. February 26.

Pamart, C. Carbonizing materials at low temperatures. 6,841. March 2.

Twinam, H. M. Dye vats. 6,273. February 26.

Sterilisation of Cooling Water

Interesting Development in Engineering Practice

An interesting development in the power world is the continuous sterilisation of the cooling water for engines and turbines, incidentally another excellent example of the combined work of the technical chemist and the engineer. Sterilisation is carried out by the addition of a measured trace of chlorine gas, generally about one part per 2,000,000, which prevents the formation of organic growths on the inside of the condenser tubes and keeps the rate of heat transmission at a maximum. On these lines the highest vacuum is maintained, and a serious drop in efficiency prevented, while the troublesome and costly hand-cleaning of the condenser tubes is eliminated. The method is also being used for the prevention of the growth of slimy deposits in cooling water towers, and for eliminating the trouble of the growth of mussels and other shell fish in pipes when brackish water or sea-water is employed.

Remarkable Records

As typical of the results being obtained, the "Chloronome" apparatus used in one well-known London power station, deals with an average amount of 72,000,000 gallons of cooling water per day, and from careful records it has been shown that the saving in coal consumption is £1,600 per annum because of the increased efficiency of the turbines, while in the same period the net reduction in operating costs amounts to £900, that is, a total saving of about £2,500 per annum. Thus, before the installation of the chlorinating plant, the net weekly cost for cleaning the condensers amounted to £30, while under the present conditions the figure (mainly made up of liquid chlorine supplied in cylinders as usual) is £11; amounting therefore to a saving of £19 per week.

The "Chloronome" is supplied by the Paterson Engineering Co., Ltd., of London, and consists of an arrangement of reducing and control valves, with metering mechanism, affixed to a panel which is connected to cylinders of chlorine; a sulphuric acid seal is included in the circuit, so that the chlorine gas inside the apparatus is kept dry, which prevents any corrosive action. The chlorine gas, generally, as stated, about one part per 2,000,000, is first dissolved in a small portion of the water, and by-passed through an absorption apparatus, a very dilute solution of chlorine being discharged to the bulk volume so as to ensure absolutely uniform chlorination.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—£15 10s. per ton f.o.b. London.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 6¾d. per lb. Crude 60's, Feb./Mar., 1s. 10½d. per gall. April/June, 1s. 10d. per gall.

ACID CRESYLIC 99/100.—2s. 3d. to 2s. 10d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 10d. to 1s. 11d. per gall. Dark, 1s. 7½d. to 1s. 8½d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED.—7¾d. to 8d. per gall. Unstrained, 6¾d. to 7d. per gall.

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 7½d. to 1s. 11d. per gall. Firm. Pure, 2s. to 2s. 1d. per gall.

XYLOL.—1s. 5d. to 2s. per gall. Pure, 1s. 8d. to 1s. 9d. per gall.

CREOSOTE.—Cresylic, 20/24%, 7¼d. to 7½d. per gall.; Heavy, 6¼d. to 6½d. per gall. Middle oil, 5d. to 5½d. per gall. Standard specification, 3¾d. to 4¼d. per gall. ex works. Salty, 7¼d. per gall.

NAPHTHA.—Crude, 8¼d. to 9d. per gall. Solvent, 90/160, 1s. 3½d. to 1s. 4d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 8d. per gall. Solvent 90/190, 1s. 1d. to 1s. 5d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 32s. to 35s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 4s. to 4s. 6d. per gall. 90/180, 2s. to 3s. per gal. Heavy, 1s. 6d. to 1s. 9d. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITHROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £54 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4¾d. to 5¾d. per lb.

LAMP BLACK.—£32 10s. per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£23 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£10 to £12 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 10d. to 7s. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s. 5d. per lb.

ACID, BENZOIC, B.P. 2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. 1½d. to 2s. 2d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. per lb.
BISMUTH CITRATE.—9s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 9d. per lb.
BISMUTH SUBNITRATE.—8s. 3d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 9d. per lb.
BISMUTH OXIDE.—12s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. to 2s. 3d. per lb.; potassium, 1s. 8½d. to 1s. 11½d. per lb.; sodium, 1s. 11d. to 2s. 2d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—B.P., 1s. 2½d. to 1s. 3d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 5½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—1s. 11d. to 2s. 2d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 9d. per lb.; potassium, 3s. per lb.; sodium, 2s. 11d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb.; U.S.P., 2s. 9d. to 3s. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 23s. per lb. net; Synthetic, 11s. to 13s. per lb.; Synthetic detached crystals, 11s. to 16s. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 6d. per lb.
METHYL SULPHONAL.—8s. 9d. to 9s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 5d. to 2s. 8d. per lb.
PHENAZONE.—3s. 9d. to 4s. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—96s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 6d. to 2s. 9d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—47s. per lb.; in quantity lower.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 3d. to 2s. 6d. per lb., B.P.C. 1923—2s. 8d. to 2s. 9d. per lb. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 6d. to 1s. 7d. per lb. Crystal, 1s. 7d. to 1s. 8d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 6d. to 6s. 9d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 12s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—6s. 6d. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 6d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—8s. 6d. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—14s. per lb.
GERANIOL (PALMAROSA).—22s. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. to 5s. per lb.
ISO EUGENOL.—16s. per lb.
LINALOL.—Ex Bois de Rose, 13s. per lb. Ex Shui Oil, 9s. 3d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 17s. per lb. Ex Shui Oil Linalol. 10s. per lb.
METHYL ANTHRANILATE.—8s. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—34s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. per lb.
RHODINOL.—50s. per lb.
SAFROL.—1s. 10d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—18s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 9s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—23s. 6d. per lb.
BOURBON GERANIUM OIL.—21s. per lb.
CAMPHOR OIL.—1s. per lb.
CANANGA OIL, JAVA.—12s. per lb.
CINNAMON OIL LEAF.—8s. 6d. per oz.
CASSIA OIL, 80/85%.—6s. per lb.
CITRONELLA OIL.—Java, 2s. 2d. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. per lb.
CLOVE OIL (90/92%).—11s. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 17s. 6d. per lb.
LEMON OIL.—16s. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE OIL, SWEET.—26s. 6d. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—13s. per lb.
PEPPERMINT OIL.—English, 87s. 6d. per lb.; Wayne County, 15s. 6d. per lb.; Japanese, 7s. 9d. per lb.
PETITGRAIN.—10s. per lb.
SANDALWOOD.—Mysore, 28s. per lb.: 90/95%. 18s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, March 7, 1929.

THE business booked during the week has been quite satisfactory, and prices continue very steady. The export trade has also been very satisfactory.

General Chemicals

ACETONE is firm at £75 to £85 per ton and in rather short supply for early delivery.

ACETIC ACID.—Technical 80% £36 10s. per ton, pure 80% £37 per ton and in steady demand.

ACID CITRIC continues slow at 2s. 1d. to 2s. 3d. per lb., less 5%.

ACID FORMIC.—There is a little better demand; price unchanged at £43 10s. for 85%.

ACID LACTIC.—The better demand continues at £43 per ton for 50% by weight.

ACID OXALIC is firm with a good demand at £30 10s. to £32 10s. per ton, according to quantity.

ACID TARTARIC.—The demand has improved with a firm position; price unchanged at 1s. 4½d. per lb., less 5%.

AMMONIUM CHLORIDE.—Unchanged.

ALUMINA SULPHATE continues very firm, with supplies short for early delivery at £7 10s. to £8 per ton.

ARSENIC.—Unchanged.

BARIUM CHLORIDE is still in good demand at £11 10s. to £12 per ton, but supplies are short for early delivery.

CREAM OF TARTAR.—The inquiry has improved and the position is firm at £93 to £97 10s. per ton for B.P. 99/100%.

COPPER SULPHATE.—Unchanged at about £28 per ton.

FORMALDEHYDE.—At present unchanged at £39 per ton, with a very firm position.

LEAD ACETATE.—The brisk demand continues with price unchanged at £42 10s. per ton for white and £41 10s. per ton for brown; position very firm.

LEAD NITRATE is unchanged at about £36 per ton, carriage paid.

LIME ACETATE is firm at £18 per ton and in short supply.

LITHOPONE is unchanged at £19 15s. to £22 per ton.

METHYL ACETONE is in good demand at £58 to £60 per ton, according to quantity.

POTASSIUM CARBONATE and CAUSTIC.—Unchanged.

CHLORATE OF POTASH.—Firm at £28 to £30 per ton; the improved demand continues.

POTASSIUM PRUSSIATE.—Very firm at £63 10s. to £65 10s. per ton, according to quantity, with a very good inquiry.

SODIUM ACETATE.—Unchanged at £21 5s. to £22 5s. per ton, with a good inquiry.

SODA BICHROMATE.—3½d. per lb., with rebates for contract, and in good demand.

SODIUM CHLORATE is unchanged at about £25 per ton.

SODIUM HYPOSULPHITE.—Unchanged.

SODIUM NITRITE.—£20 per ton, with a very good inquiry and firm position.

SODIUM PHOSPHATE.—About £12 per ton for di-basic and £17 per ton for tri-basic.

SODIUM PRUSSIATE is firm at 4½d. to 5½d. per lb., according to quantity, and in good demand, with position firm.

SODIUM SULPHIDE.—At British makers' prices, which are unchanged.

TARTAR EMETIC is rather slow at 10½d. per lb.

ZINC SULPHATE.—£12 5s. per ton and in fair demand.

Coal Tar Products

There is little change in prices of coal tar products to report from last week, the market remaining rather quiet.

MOTOR BENZOL remains scarce, at about 1s. 7½d. to 1s. 8d. per gallon, f.o.r. makers' works.

SOLVENT NAPHTHA is unchanged at 1s. 1½d. per gallon, f.o.r.

HEAVY NAPHTHA is quoted at 1s. 1d. to 1s. 1½d. per gallon, on rails.

CREOSOTE OIL remains weaker, and can be bought at 4¾d. per gallon on rails in the North, and at 5¾d. per gallon in London.

CRESYLIC ACID is unchanged, the 98/100% quality being quoted at about 1s. 10d. per gallon, and the Dark quality 95/97% at about 1s. 8d. per gallon f.o.r.

NAPHTHALENE.—The firelighter quality remains at about £4 10s per ton, the 74/76 quality at £5 per ton, and the 76/78 quality at £6 to £6 5s. per ton.

PITCH is unaltered, at 31s. to 33s. per ton, f.o.b.

Nitrogen Products

Sulphate of Ammonia is still quoted at £10 2s. per ton f.o.b. U.K. port in single bags. Although at the moment the demand is not large it is understood that stocks in consuming countries are being reduced, and it is expceted that further buying will set in.

Home.—On account of the recent severe weather, merchants inform us that the demand for sulphate of ammonia is about a month late this year. A spell of fine weather will, no doubt, witness an enormous demand for immediate delivery.

Nitrate of Soda.—The severe frost all over Europe has resulted in a more sluggish movement in the stocks of nitrate. It is understood that good sales have been made at prices fixed for the various markets. The demand for nitrate of soda comes a little later than for sulphate of ammonia, and at present it is quite impossible to gauge what the actual consumers' demand will be.

Latest Oil Prices

LONDON, March 6.—LINSEED OIL was dull at 2s. 6d. to 5s per ton decline. Spot, ex mill, £29 15s.; March-April, £28 17s. 6d., May-August, £29; and September-December, £29 12s. 6d., naked. RAPE OIL was steady. Crude extracted, £42 10s.; technical refined; £44 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £28 10s.; refined common edible, £34; and deodorized, £36, naked, ex mill. TURPENTINE was inactive and unaltered, American, spot, 45s. 9d.; April to June, 46s. per cwt.

HULL.—LINSEED OIL.—Spot to April, £28 17s. 6d.; May-August, £29; September-December, £29 7s. 6d. per ton, naked. COTTON OIL.—Bombay crude, spot, £27 10s.; Egyptian crude, spot (new) and March-April, £28; edible refined, spot and March-April, £31 10s.; technical, spot, £31 5s.; deodorized, spot, £33 10s. per ton, naked. PALM KERNEL OIL.—Crushed, 5¼ per cent., £35 10s. per ton, naked. GROUNDNUT OIL.—Crushed/extracted, £36; deodorized, £40 per ton. SOYA OIL.—Extracted and crushed, £31; deodorized, £34 10s. per ton. RAPE OIL.—Crushed/extracted, £42 10s.; refined, £44 10s. per ton, net cash terms, ex mill. TURPENTINE, CASTOR OIL, and COD OIL unchanged.

South Wales By-Products

SOUTH WALES by-product activities are unchanged. Pitch has a slightly better demand, but values are unchanged round 33s. to 35s. per ton. Road tar maintains its brighter tendency, and has a steady call round about 11s. to 14s. per 40 gallons barrel. Crude tar is not quite so good, but prices are firm round 30s. to 32s. per ton. Solvent naphtha has a good demand at from 1s. 2d. to 1s. 4d. per gallon, but heavy naphtha is weak at from 11d. to 1s. per gallon. Refined tars are in better demand, but quotations are unchanged, coke oven tar changing hands at from 7d. to 7¾d. per gallon, delivered, and gasworks tar at from 6½d. to 7d. per gallon, delivered. Crude naphthalene has scarcely any call round about 80s. per ton, while a similar remark applies to whizzed at 100s. per ton. Patent fuel and coke exports continue to improve, but are still far from satisfactory. Patent fuel, ex-ship, Cardiff, from 21s. to 21s. 6d. per ton; ex-ship Swansea, from 19s. to 19s. 3d. per ton. Coke, best foundry, 32s. 6d. to 36s. 6d.; good foundry, 26s. 6d. to 32s., and furnace from 19s. to 21s. per ton.

Italian Tartar Syndicate

MR. G. BELTRAMI, Alder House, Aldersgate Street, London, E.C.1, writes:—"As no doubt you are aware, I am acting here as agent of the Italian Syndicate of Cream of Tartar and Tartaric Acid, consequently, I am constantly informed with regard to the position of raw material, prices, etc. I think it might interest you to know that the Italian works, owing to scarcity of raw materials, have been compelled to increase recently their price for cream of tartar, and a further increase might be expected shortly. With regard to tartaric acid, no decision has been made so far, but the market is very firm.

Farming with Cyanamide

FERTILIZER SALES, LTD., of Adelaide House, London, E.C.4, have issued a revised (1929) edition of "Up-to-date Farming with Cyanamide." This booklet (32 pages), which is obtainable free on application, is divided into five sections, as follows:—general information and advice (manufacture of calcium cyanamide, application, storage, etc.); special advantages of cyanamide; cyanamide for arable crops; cyanamide for grassland; and cyanamide for horticulture.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, March 6, 1929.

THE past week has brought some slight improvement in the volume of business put through in heavy chemicals, export inquiry being, as for some little time past, rather better than that for home consumption. Prices remain practically unchanged.

Industrial Chemicals

ACETONE B.G.S.—£76 10s. to £85 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC 98/100%.—Glacial, £56 to £67 per ton according to quality and packing c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Unchanged at 6¼d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. 2½d. per lb., less 5%, ex store, spot delivery. Offered at 2s. 2¼d. per lb., less 5%, ex wharf, prompt shipment from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC.—80° quality, £24 10s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—Spot material rather easier, and some supplies obtainable at a fraction less than 3½d. per lb., ex store. Offered for prompt shipment from the Continent at 3⅛d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Spot material now quoted 1s. 4½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Spot material rather dearer at about £6 per ton, ex store. For prompt shipment £5 15s. per ton, c.i.f. U.K. ports.

ALUM LUMP POTASH.—Unchanged at about £8 12s. 6d. per ton, c.i.f. U.K. ports. Crystal meal offered on spot at £9 per ton, ex store.

AMMONIA ANHYDROUS.—Quoted 9½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations, or f.o.b. U.K. stations.

AMMONIA LIQUID 880.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Unchanged at about £35 per ton, c.i.f. U.K. ports, prompt shipment from China. Spot material quoted £39 per ton, ex store.

ARSENIC WHITE POWDERED.—Quoted £18 10s. per ton, ex wharf, prompt despatch from mines. Spot material on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—On offer from the Continent at £10 5s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers price, £4 5s. to £4 15s. per ton, according to quality and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

COPPER SULPHATE.—Steady and price about £25 15s. per ton, ex wharf.

FORMALDEHYDE 40%.—Good inquiry and price unchanged at about £37 10s. per ton, ex store.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—On offer at £29 15s. per ton, ex store.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 10s. per ton. Brown on offer about £39 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE 96/98%.—Spot material quoted £26 10s. per ton, ex store. Offered from the Continent £25 10s. per ton, c.i.f. U.K.

POTASSIUM CHLORATE 99¾/100%.—Spot material now quoted. Powdered £25 per ton, ex wharf. Rather better inquiry.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Offered for prompt shipment from the continent at 6¾d. per lb., ex wharf. Spot material quoted 7d. per lb., ex store.

SODA CAUSTIC.—Powdered 98/99% now £17 10s. per ton in drums; £18 15s. per ton in casks. Solid 76/77%, £14 10s. per ton in drums; 70°/72%, £14 2s. 6d. per ton in drums, all carriage paid buyers' station, minimum four-ton lots, for contracts 10s. per ton less.

SODIUM ACETATE.—65% crystal quality quoted about £19 15s. per ton, ex wharf; 73/78% anhydrous quality on offer at £20 per ton, carriage paid buyers' stations.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—3½d. per lb. delivered U.K. or c.i.f. Irish ports, less 2½% for contract of minimum 2½ tons.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 1s. 3d. per ton, ex quay, minimum four-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum four-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Ordinary quality quoted £10 12s. per ton, carriage paid, buyers' sidings, minimum six-ton lots, usual extras for small quantities and refined qualities.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid 60/62%, £9 per ton. Broken 60/62% £10 per ton. Crystals 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now quoted £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Extensions of Nitrate Selling Scheme

THE Chilean nitrate sales scheme, which came into operation in August last, was originally entered into for a period of about two years, and would have terminated on June 30, 1930. The Chilean Nitrate Producers' Association have now decided to extend the life of the association until June 30, 1939; to incorporate into the association the Selling Corporation formed last August; and to introduce into the statutes a number of new provisions giving the directorate wider powers of rapid action. The Chilean Government declares that it will spare no efforts to help the nitrate industry to increase its production still further and to extend its markets. To contribute to this policy the Government announces its intention o make use for the benefit of the industry of the ample powers which the Nitrate Law gives it. From this declaration Aikman, Ltd., in their fortnightly report, assume that the help being accorded to the industry during the current year—estimated at about £2,000,000—will be on a rising scale in the future. It is also announced that the Anglo-Chilean Corporation is becoming a member of the Nitrate Producers' Association.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, March 7, 1929.

Reports generally agree that operations on the chemical market here have been only of comparatively moderate extent during the past week so far as the prompt market is concerned, although deliveries of a good many of the "bread-and-butter" lines to contract consumers are reported to be not unsatisfactory. With regard to quotations these are steady to firm in most sections.

Heavy Chemicals

Saltcake is attracting only a relatively limited amount of attention, with current offers of this at about £2 12s. 6d. per ton. There has been little change in the position of phosphate of soda; demand is on moderate lines and quotations are down to about £12 per ton. Sulphide of sodium comes in for a certain amount of inquiry and prices are maintained at £9 10s. per ton for the 60-65 per cent. concentrated solid quality, and about £8 for the commercial grade. Chlorate of soda is in quiet request and about unchanged on the week at from 2⅝d. to 2¾d. per lb. A fair weight of business is being put through in the case of alkali and quotations are firm at about £6 per ton. Bicarbonate of soda, also, is moving off in moderate quantities, with offers still in the neighbourhood of £10 10s. per ton. Bleaching powder is in quietly steady demand and values are maintained at round £7 per ton. There is a fair trade passing in prussiate of soda, and values of this material continue firm at from 4½d. to 5d. per lb., according to quantity. With regard to caustic soda, sales in this section of the market are on steady lines and values keep up at from £12 15s. to £14 per ton, according to quality, and in contracts. Hyposulphite of soda is not particularly active at the moment, and signs of easiness are apparent here and there; the commercial product is quoted to-day at about £9 5s. per ton and the photographic grade at £15 10s. Bichromate of soda continues to attract a fair amount of interest from consumers, and quotations in this section show little sign of giving way, current values being on the basis of 3½d. per lb.

Among the potash products, yellow prussiate continues very firm at from 6¾d. to 7¼d. per lb., according to quantity, and a fairly steady business is being put through. There has been little improvement in the demand for permanganate of potash, and values are on the easy side at 5d. to 5⅛d. per lb. for the commercial material, and 5⅜d. for the B.P. Bichromate of potash is unchanged at 4½d. per lb. basis, and a quietly steady trade in this section has been reported this week. Chlorate of potash is about maintained at 3d. per lb., but the demand is rather slow. There is a moderate inquiry about for carbonate of potash, offers of which range from £26 to £26 5s. per ton, ex store. Interest in caustic potash has been maintained, and prices are held at £33 5s. per ton for prompt delivery of one to five-ton lots.

Sulphate of copper continues to display a very firm tendency at round £28 5s. per ton, f.o.b., and sales of this material are moderately active. With regard to arsenic, buying interest is somewhat subdued and values are easy at £16 to £16 5s. per ton, at the mines, for white powdered, Cornish makes. There is a moderate demand about the acetates of lime, with grey quoted at round £17 per ton and brown at from £8 15s. to £9. Nitrate of lead is steady, but only in quiet request at from £34 10s. to £35 per ton, with acetate of lead still on offer at round £39 per ton for brown and £40 for white.

Acids and Tar Products

Oxalic acid is about unchanged on the week at £1 11s. 6d. per cwt., but the demand for this material is rather slow. Tartaric acid is firm in tendency at from 1s. 4¼d. to 1s. 4½d. per lb., and a fair volume of inquiry is being met with. Citric acid is fairly steady and in moderate demand at 2s. 2d. per lb. Acetic acid is selling in moderate quantities, with the commercial 80 per cent. quality quoted at £36 to £36 10s. per ton and the glacial at £66.

In the by-products section there is a quiet demand about for creosote oil at from 4d. to 4¼d. per gallon, naked. Pitch is still rather inactive, but values show little change at round £1 12s. 6d. per ton, f.o.b. Solvent naphtha is dearer in sympathy with the rise in petroleum products, with offers at from 1s. 3½d. per gallon. Crystal carbolic acid is steady and in fair demand at 6¼d. per lb., with 60's crude still quoted at about 1s. 10d. per gallon.

Company News

Tarmac, Ltd.—The directors recommend a dividend of 5½ per cent., subject to income tax, on the ordinary shares, for the year.

British Alizarine Co.—The directors report a profit for the year 1928 of £22,542, which compares with £23,051 for 1927 and £11,890 for 1926. After writing off the usual £20,000 for depreciation, the directors recommend that the balance of £54,981 be carried forward, against £52,438 brought in. For the fourth successive year no dividend is to be paid on the company's shares, the last dividend being 2½ per cent. for 1924.

Joseph Crosfield and Sons.—After charging all repairs renewals and alterations, depreciation and insurance, the balance standing at the credit of profit and loss account for the year ended November 30 last is £455,755, as compared with £461,806 for 1927. Adding £44,857 brought in, there is a total of £500,612. It is proposed to pay a dividend on ordinary shares at the rate of 10 per cent. and to place to general reserve £100,000, both as last year, carrying forward £23,112.

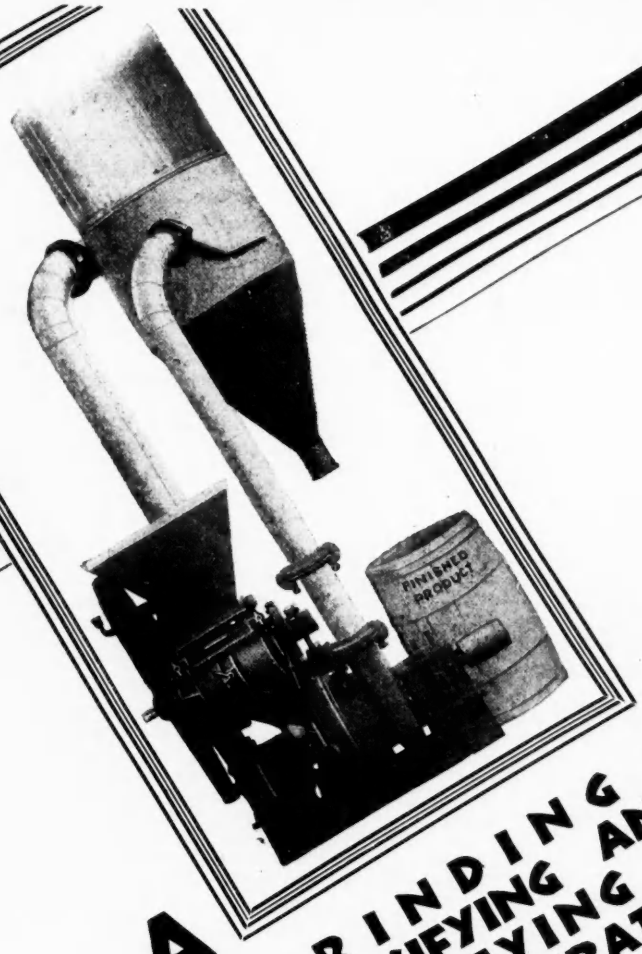
Waxed Papers, Ltd.—For the year ended December 31 last, the report states that the profit on trading amounted to £9,463, which, with the balance brought forward of £6,090, makes a total of £15,553. It is proposed to pay a dividend on the ordinary shares for the year of 2½ per cent. (less tax) carrying forward £3,661. The directors regret that, owing to increasing competition in industry necessitating reduction of selling prices, profits for the year compare unfavourably with those of the previous year.

British Metal Corporation.—After appropriating £100,000 to reserve, the net profit for the year ended December 31 last, is £144,452. Dividends at the rate of 6 per cent. per annum on the preference shares absorb £54,000, and the directors recommend a dividend of 10 per cent., less tax, on the ordinary shares, being the same as last year, and requiring £90,000, leaving £25,184 to be carried forward, contrasting with £24,732 twelve months ago. The annual meeting will be held on March 13, at the Fur Trade Sale Room, London, at 2.30 p.m.

Celanese Corporation of America.—The net profit from operations for the year ended December 31, 1928, amounts to $4,012,895. After deducting income tax, depreciation, inventory adjustment, etc., there remains a net income of $2,356,976. Dividends on the 7 per cent. preferred absorb $578,828, and on the 7 per cent. participating preferred $1,037,253, leaving a surplus of $740,895, which, with the net surplus brought in of $1,333,611; makes a total surplus earned of $2,074,506, subject to payment of participating dividend of 10 per cent. for 1928.

Cerebos (Ltd.).—The profit for the year to November 30 last amounts to £177,326, against £151,429 for 1927. Adding the balance from last year of £51,761, there is available £229,087. The directors recommend a dividend of 25 per cent. (free of income tax), as last year, placing to reserve £50,000, as compared with £30,000, leaving to be carried forward £79,087. It is proposed that £100,000, part of the amounts standing to the credit of the reserve accounts, be capitalised and distributed to the shareholders in the form of fully-paid ordinary shares at the rate of one such ordinary share for every four of the existing ordinary shares. These new bonus shares will not participate in the dividend recommended above.

Southall Brothers and Barclay.—The accounts for the year ended December 31, 1928, show that after providing for income tax, directors' remuneration, depreciation and bad debts, a cash bonus of £4,000 to employees and staff, and £2,300 to pension fund, there is a balance of profit of £64,200. To this is added £15,852 brought forward, making £80,052. The directors recommend year's dividend on ordinary shares at rate of 12½ per cent. per annum, free of income tax (less interim dividend of 5 per cent., paid October 1, 1928, free of income tax), together with a bonus of 1s. 6d. per share, free of income tax, placing to reserve (making that fund £200,000) £30,826, and carrying forward £16,726. An interim dividend of 5 per cent. (tax free) will be paid on or about October 1, if result of first nine months' trading appears to warrant it.



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RAYMOND PULVERISERS

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

GALJADO PERFUMERY CO., LTD., 93, Worship Street, E.C., wholesale chemists. (C.C., 9/3/29.) £10 8s. 3d., January 2.

HEWITT AND SON, 238, Blackfriars Road, S.E., wholesale chemists. (C.C., 9/3/29.) £20 6s. 1d., January 31, and £22 8s., January 28.

London Gazette, &c.

Companies Winding Up Voluntarily

BEANES (E.) AND CO., LTD. (C.W.U.V., 9/3/29.) By special resolution, February 8, confirmed February 25. G. B. Norton, chartered accountant, 66, Coleman Street, London, E.C.2, appointed as liquidator.

LEWIS ANDREW, LTD. (C.W.U.V., 9/3/29.) By special resolution, February 1, confirmed February 19, H. Marshall, 18, Union Road, Underbank, Stockport, appointed as liquidator.

POLI-VARN, LTD. (C.W.U.V., 9/3/29.) By special resolution, February 4, confirmed February 20. A. R. T. Haynes, 45, Wardrobe Chambers, London, incorporated accountant, appointed as liquidator.

Partnership Dissolved

SHERIFFS (J. A.) & CO. (John Alexander SHERIFFS and Hugh MACKAY), chemical manufacturers, East Silvermills Lane, Edinburgh, as at December 31, by mutual consent, by the retiral of J. A. Sheriffs. The business will be carried on by H. Mackay, under the old name.

New Companies Registered

BRITISH FELSPAR, LTD., 159, Queen Victoria Street, London, E.C.4.—Registered March 2. Nom. capital, £2,500 in 1,000 7 per cent. cumulative participating preference shares of £1 each and 30,000 ordinary shares of 1s. each. Artistic and commercial cellulose sprayers, to manufacture articles suitable to be sprayed, etc. Directors: H. J. Terry, Capt. F. N. H. Nias, H. J. Terry.

LANCASHIRE CANDLE CO., LTD., Mode Wheel, Trafford Park, Manchester.—Registered March 2. Nom. capital, £20,000 in £1 shares. Candle makers, soap manufacturers, wax bleachers, sterin makers and ozokerite refiners, etc. Directors: J. W. Frye, M. Temple, and S. Collier.

W. H. LEGAT, LTD., Cross Axes, 16, St. Georges Street, Bolton.—Registered February 28. Nominal capital, £10,000 in 7,000 ordinary and 3,000 employees' shares of £1 each. To acquire from W. H. Legat, the business of a manufacturing chemist carried on by him at Cross Axes, 16, St. Georges Street, Bolton, and to carry on the business of consulting, analytical, manufacturing, pharmaceutical and general chemists, etc.

RECONSTRUCTED FUEL CO., LTD., 68, Lincoln's Inn Fields, London, W.C.2.—Registered March 1. Nom. capital, £100 in £1 shares. To acquire from J. E. Hackford the benefit of an invention for a new process for the simultaneous carbonising and reconstruction of coal, small coal, coal dust, lignite, peat, shale and any other organic and inorganic substances and the extraction therefrom of certain products, etc. Directors: J. E. Hackford, C. Lockett-Hughes, and J. Nadler.

THAWPIT EXPORTS, LTD., Cross Keys House, Moorgate London, E.C.2.—Registered as a "public" company on March 2. Nom. capital, £175,000 in 5s. shares. To acquire from Thawpit, Ltd., of Signum House, 38, Gordon Square, London, W.C.1, the benefit of certain inventions, trade marks, goodwill, etc., relating to an existing business dealing in a cleaning fluid called "Thawpit" now carried on by that company in connection therewith in countries outside Great Britain, and to carry on the business of manufacturers or producers of and dealers in chemicals, chemical mixtures and compounds, etc.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C 2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to March 27, 1929.

TOPAZ.

495,921. Class 1. Glue. British Glues and Chemicals, Ltd., Imperial House, 15, 17 and 19, Kingsway, London, W.C.2; manufacturers.—October 13, 1928.

FLOTOL.

497,092. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives, but not including waterproofing preparations for use on walls and roofs of houses, and not including any goods of a like kind to any of these excluded goods. I.G. Farbenindustrie Aktiengesellschaft (a Corporation organised under the laws of Germany), 28, Mainzer Landstrasse, Frankfort-on-Main, Germany; manufacturers.—November 15, 1928. To be Associated with No. 497,093 (2,651).

BLUNDELL.

(Advertised before acceptance, the applicants alleging distinctiveness.)

497,677. Class 1. Paints, colours, varnishes, enamels, wood stains, distempers, wood preservatives and anti-corrosives. Blundell, Spence and Co., Ltd., 9, Upper Thames Street, London, E.C.4; and Beverley Road, Hull; paint, colour, oil and varnish manufacturers. December 3, 1928. (To be Associated with No. 67,681 (524) and others.)

SOLIGEN.

498,490. Class 1. Varnishes and lacquers and chemical substances for use in the manufacture of varnishes and lacquers. I. G. Farbenindustrie Aktiengesellschaft (a Corporation organised under the laws of Germany), 28, Mainzer Landstrasse, Frankfort-on-the-Main, Germany; manufacturers. December 27, 1928. (To be Associated with No. 228,816 (1,148).)

VETSULES.

499,336. Class 2. Chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. The British Drug Houses, Ltd., 16 to 30, Graham Street, City Road, London, N.1; wholesale druggists. January 24, 1929.

FORMOIDS.

492,912. Class 3. Chemical substances prepared for use in medicine and pharmacy. Boots Pure Drug Co., Ltd., 37, Station Street, Nottingham; chemists and druggists. June 30, 1928. (To be Associated with No. 492,911 (2,657).)

REGELAC.

492,933. Class 3. Chemical substances prepared for use in medicine and pharmacy. Boots Pure Drug Co., Ltd., 37, Station Street, Nottingham; chemists and druggists. June 30, 1928. (To be Associated with No. 489,457 (2,621) and others.)

Tariff Changes

CYPRUS.—An order-in-council dated December 24, 1928, provides for the duty-free importation into Cyprus of citric acid and metabisulphite.

TURKEY.—The Board of Trade have received a copy of Law No. 1369, passed by the Grand National Assembly of Turkey on December 15, 1928, relating to the import, export, manufacture and sale of narcotic drugs. Copies of a translation of the law may be seen at the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.